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THE MISSISSAUGA MIRACLE

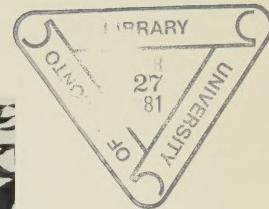
DEPOSITORY LIBRARY MATERIAL



A few days after the derailment crisis had ended, representatives of the major participants were presented to the Ontario legislature. Ontario Premier William Davis met them in his office to offer his personal congratulations.



Left to right: Premier Davis, Chief Douglas K. Burrows of Peel Regional Police, Mayor Hazel McCallion of the City of Mississauga, Fire Chief Gordon Bentley of the City of Mississauga, Brigadier-General J.F. Westhead, chairman of emergency services, Ontario Division, the Canadian Red Cross Society, and Solicitor General Roy McMurtry.



It is with great pride and appreciation that this book is dedicated to all those who helped in any way during the emergency situation in Mississauga.

"Mississauga Miracle" also has a very practical side for it provides a precise and accurate account of how our citizens --- assisted by volunteers and professionals --- reacted to and coped with potential danger. In response to requests from municipalities across Canada and from around the world, we take pride in making this publication available.

I believe this story of how we were during that week in November 1979 speaks highly of the humanity and compassion of our people and the values and principles of our society.

William G. Davis
Premier of Ontario



DERAILMENT

THE MISSISSAUGA MIRACLE

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Ontario

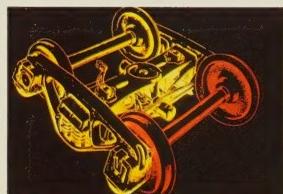
The Train

This was to be one of the many dull, uneventful runs. A 106-car train carrying a mixed cargo, including dangerous chemicals, rolling through Ontario's rich farmland and heavily-populated areas to rail yards in the northeast end of Metropolitan Toronto. And so it was until just before midnight, November 10, 1979.

Canadian Pacific Railway train 54 began its fateful journey in early afternoon at Windsor in the southwestern part of Ontario. It stopped in Chatham 90 minutes later where it picked up cars from a train arriving from Sarnia. Some of these cars were carrying caustic soda, propane, chlorine, styrene and toluene, a cargo which causes environmentalists to shudder and warn of horrendous derailment nightmares.

After connecting the tank cars, the train left Chatham at 6 p.m. to travel east to London where crews were changed before it continued its journey towards Toronto.

As the train passed the Milton area, about 40 kilometres from the outskirts of Metro Toronto, lack of lubrication in a wheel bearing apparently started to spell trouble. On one car, the journal box at each end of the axle, where friction builds up between the moving axle and the car above, was an old-fashioned type, needing lubrication by oil. Modern freight cars have roller bearings, which don't heat up as do the older friction or journal bearings. However, when the journal box lacks lubrication, tremendous heat builds up. In trainmen's vernacular, the overheated journal box becomes a "hot box".



Residents living beside the tracks later reported seeing smoke and sparks coming from the middle section of the train. As the train progressed, people living closer to Mississauga, a community just west of Toronto, thought part of the train was on fire. Friction burned the journal bearing causing the stub of the axle to break off. Immediately after the train passed the Burnhamthorpe Road level crossing, the 33rd car — the one with the hot box and with a cargo of toluene — lost one of its four axles, complete with glowing wheels. The set of wheels crashed through a fence and landed in the backyard of a house, about 15 metres from the tracks and three kilometres from the Mavis Road crossing.

The train went past a further residential section of apartment buildings and suburban homes with its undercarriage hanging until reaching the Mavis Road crossing in a light industrial area about 30 kilometres from downtown Toronto. The dangling undercarriage left the track three minutes after losing the axle. Twenty-three other cars followed the tanker, causing a deafening crash and squeal of iron as cars collided at the Mavis Road crossing. On impact, some propane cars burst into flames. That was 11:53 p.m. — the beginning of a tense week for thousands of Mississauga residents.

As the derailed train's tank cars became twisted and tangled, tankers containing styrene and toluene were punctured, spilling their chemicals on to track beds. Within a minute, flammable liquids and vapors ignited, causing a massive explosion of a tank car. The yellowish-orange fire rose to a height of 1,500 metres and could be seen 100 kilometres

away. The fire was fed by six dangerous ingredients — 11 tank cars of propane, four with caustic soda, three with styrene, three with toluene, two box cars with fibreglass insulation and one with chlorine. While chlorine is non-combustible in air, most combustible materials will burn in chlorine as they do in oxygen. Liquid propane, styrene and toluene are flammable while caustic soda is not combustible, but in solid form and in contact with moisture or water, it may generate sufficient heat to ignite combustible materials.

As the flames erupted, trainman Larry Krupa jumped out of the engine and ran towards the derailed portion of the train. He closed a cock on the 32nd car which permitted engineer Keith Pruss to drive the front part of the train eastward along the tracks out of danger.

Citizen reaction was immediate. Police and fire department switchboards lit up with a flood of calls alerting them of the derailment. Officers on patrol and at the station closest to the derailment saw the fire. Within minutes, firefighters began connecting hoses and police were setting up roadblocks at the derailment site. Both reported to their headquarters a similar message — more help was needed urgently.

SUNDAY

As firefighters made preliminary plans to battle the fire, a violent explosion at 12:10 a.m., caused by a propane tanker blowing up, showered the surrounding area with large chunks of metal. The force of the explosion knocked police officers, firefighters and curious onlookers to the ground.

At Left: The exterior of a journal box.

Middle: The interior of a journal box. If this area is not lubricated by oil, the journal box overheats and becomes a "hot box."

At Right: A sketch of a train's axles, wheels and journal boxes.



Near the explosion, a green haze was seen drifting in the air. Along a kilometre stretch, windows were shattered and three greenhouses and a municipal recreational building destroyed.

Between five and 10 minutes later, a second explosion erupted. A bleve (boiling liquid expanding vapor explosion) in another propane tank car hurled the car in the air, spewing fire and landing in a clear area. It tumbled across a field before coming to rest 675 metres northeast of the Mavis Road crossing.

Five minutes later, another bleve in a propane car occurred with one end of the car travelling about 65 metres.

By now, CP Rail dispatchers' offices in London and in Agincourt, northeast of Toronto, the ultimate destination of train 54, were notified of the derailment through CP's radio system.

Meanwhile, hasty telephone calls were also placed to Mississauga Fire Chief Gordon Bentley, Police Chief Douglas K. Burrows, and the Ontario Ministry of the Environment. Mayor Hazel McCallion telephoned the police after her son climbed on the roof of the family house in nearby Streetsville to describe the blazing fire.

Police and fire officials acquired the train's manifest, a description of the cargo and emergency procedures, from the conductor, but it was unintelligible. Another copy was subsequently requested from the CP Rail dispatcher in Toronto. The front part of the train, which had the other copy of the manifest, arrived in Cooksville, about six kilometres from the derailment. At 1:30 a.m., a readable copy of the manifest was delivered to a makeshift command post, which had been established shortly after the derailment in a building just south of the fire.

Peel Regional Police and other emergency services established on-site emergency command posts just south of the site. Peel Police Chief Burrows and his Deputy Chief William Teggart assumed control of the police command centre. Members of neigh-

boring police forces, fire departments and ambulance services had been alerted or volunteered services.

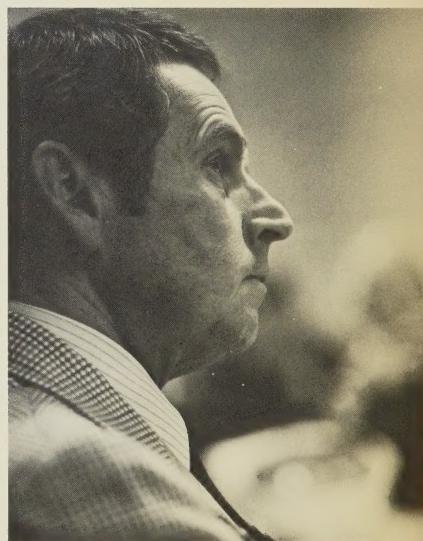
After obtaining the manifest, senior officials gathered for a meeting to evaluate the situation. This meeting involved the police chief, Deputy Fire Chief Arthur Warner, Chief Fire Inspector Cyril Hare, various CP Rail officials, two officials from the Ontario Ministry of the Environment and some local chemical experts. On checking the serial numbers of the derailed cars with the manifest, some worst fears were confirmed. The derailed cars were carrying a mixed cargo of dangerous chemicals. In the command post, officials discussed the possible chlorine gas threat. Chlorine, a deadly chemical, forms a greenish-yellow cloud when released and is so heavy that it often hovers close to the ground. Since its mass weight is roughly 2.5 times that of air, a cloud of chlorine will slump following the terrain as it drifts and disperses. This feature led to its use as a weapon in the First World War at Ypres, Belgium, where thousands of Canadian soldiers were killed as a result of the gas release. Once chlorine gas is breathed, it saps the fluids in the linings of lungs and blood and starts a chain reaction that ends with slow suffocation.

At the site, it was quickly deduced that the chlorine tanker was indeed close to a filled propane tanker in continuing danger of exploding. After consulting with Fire Chief Bentley, the police chief made the first tough decision of the long week. He ordered 3,500 residents living closest to the derailment to leave the area for their own safety. With the yellow and red fire background, police officers using loud hooters or knocking on doors alerted sleepy residents of the evacuation notice. This evacuation — the first of 13 in a 20-hour period — began about two hours after the car went off the tracks.

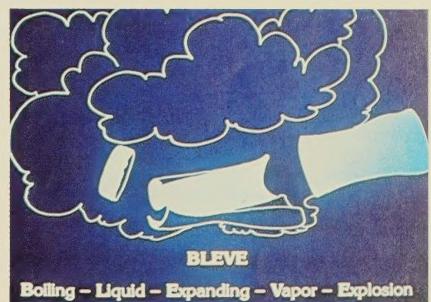
Later, as winds shifted and more information about the fire and the train's cargo became known, areas of evacuation were widened. Shortly after 2

a.m., Metropolitan Toronto Police sent sound trucks to assist in telling residents of the evacuation. Police arranged for the selection and establishment of evacuation centres for those who could not stay with friends and relatives outside the area. The Mississauga section of the Canadian Red Cross Society began organizing for registering and feeding evacuated residents at reception centres. Square One, a huge covered shopping centre 2.4 kilometres northeast of the derailment, was selected as the first centre.

Other preparations started. The provincial Ambulance Co-ordinating Centre sent a general call for ambulances in the surrounding area. One



Peel Police Chief Douglas K. Burrows



Boiling - Liquid - Expanding - Vapor - Explosion

At Left: On impact, some propane tankers burst into flames, creating a spectacular fire.

Top Right: A bleve in a propane tanker hurled the car into the air, spewing fire and landing northeast of the crossing. The arrow follows its path.

Above: When the pressure of liquified gases is reduced, rapid vaporization occurs along with a large liquid-to-vapor expansion, which can crack open the container. If ignited, a bleve results in a fire ball.

hundred and thirty-nine ambulances and 300 ambulance workers arrived in the area within six hours of the accident from as far south as Niagara Falls (130 km) and as far east as Kingston (275 km). Twenty-seven other vehicles were also provided, including buses from the Toronto Transit Commission, Oakville Transit and Mississauga Transit.

Throughout the night and early morning as machinery arrived and plans developed, experts to handle the dangerous substances also entered the scene. Experts from chlorine emergency plan, (CHLOREP), arrived armed with their equipment headed by Stu Greenwood and his team from Dow Chemical Co. in Sarnia, owners of the chlorine in the tanker. Experts agreed that it would be impossible to seal the chlorine tanker leak until the propane fires had burnt themselves out.

Firefighters continued to increase the spray of water, and more water lines were added. Eventually 10 master streams were applied through about 4,000 metres of hose. After an hour at the scene, it was decided that firefighters would cool the cars and not extinguish the flames. This would allow a controlled burn of escaping gases and avoid possible explosions. Shortly after another area was ordered evacuated, Chief Burrows moved the



The arrow indicates where the chlorine tanker was located in the fire.

police command post because of a shift in winds. The mobile communications trailer of the Ontario Provincial Police joined other trailers at the new command centre in a Bell Canada building less than a kilometre north of the derailment.

Just before 5 a.m., officials at the scene decided that the seriousness of the situation was not diminishing and that provincial officials, including Solicitor General Roy McMurtry should be notified. Under provincial government guidelines on such emergencies, the solicitor general was the provincial official in charge as chairman of emergency planning committee of the Ontario Cabinet. Other local officials such as Frank Bean, Chairman of Peel Region Council, and Mississauga city councillors, Peel Region's social services department and Mississauga city employees were also alerted.

As dawn broke on a dull cool day, the first four members of "think tank" group, the decision-making committee, which would operate during the next six days, met at 7:30 a.m. It included Bean, Mayor McCallion, Chief Burrows and Fire Chief Bentley.

About an hour later, Chief Burrows issued another evacuation notice. But the later decision to evacuate Mississauga General Hospital and two adjacent nursing homes would be most dramatic and tense.

With the arrival of Solicitor General Roy McMurtry and Deputy Minister John Hilton, further meetings were held and the evacuated areas were increased as the threat to public health and safety became apparent. By 1:30 p.m., the boundaries were further extended south to Lake Ontario and Square One, the first evacuation centre, was closed although it was just north of the evacuated border. Evacuees were transferred to other centres.

As winds shifted, new dangers were presented, forcing more and more residents to join the exodus — some with packed luggage and others with

Sunday dinner abandoned on the stove.

At the day's end, about 218,000 persons had left their homes, six nursing homes, and three hospitals including Oakville-Trafalgar Hospital, just outside the western border, and Queensway Hospital, just beyond the eastern boundary. The southern part of Mississauga, Canada's ninth largest city with a population of 284,000 was a virtual ghost town.

MONDAY

It truly was a closed city. Commuter traffic to Toronto was rerouted around the evacuated area, causing massive traffic jams for the rest of the week. The Queen Elizabeth Way, the busiest stretch of highway in Canada, which runs through the central part of the Mississauga core, was closed at its eastern and western entrances to Mississauga. Officials feared that a propane tanker might explode during the rush hours or that chlorine might waft over the highway, trapping thousands of commuters in their cars.

By 10 a.m., three or four propane cars continued to burn but these fires were under control. Firefighters were sticking to the strategy of permitting the fires to burn themselves out. Because of various explosive vapor-producing substances, firefighters were ordered only to confine and control the flames.

Meanwhile, Procor Ltd., of nearby Oakville, a major manufacturer of railway tank cars, prepared a steel patch to cover a one-metre hole in the tanker. Photographs revealed the hole, and it was surmised that at least some chlorine had escaped. But at this point, it was not known how much remained in the tank. The task then involved attempts to find out how much chlorine was left in the tanker and to cover the hole to prevent more leakage.

During the day, railway crews removed box cars and tankers, which had not been derailed, attempting to clear as much debris as possible

An aerial view of the wreckage and the derailment site.



without disturbing the chlorine tanker and propane tankers piled around. Chemical experts worked to devise ways of eliminating the chlorine threat while staff of the Ontario Ministries of the Environment and Labour were constantly monitoring air in the area. Most samples showed no hazard for healthy adults but a few pockets of chlorine gas had collected in low-lying areas near the site. However, there were enough chemicals in the air to cause discomfort over a significant area.

In reception centres, volunteer groups — Red Cross and St. John Ambulance — supervised the settling of displaced residents and overall co-ordination of food and health services. Meanwhile, police patrolled deserted streets and checked all vehicles entering the area for possible stolen property. Officials could not consider lifting the evacuation until the fire was out and the chlorine danger had ended.

TUESDAY

A sigh of relief was breathed by anxious experts and officials when the propane flame finally went out at 2:30 a.m. Most firefighting equipment was removed

from the site. The all-out effort was now concentrated on patching the tanker.

In late morning, patients were being returned to Queensway Hospital and Oakville-Trafalgar Hospital, which were just outside the fringes of the evacuated areas, but were closed as a precaution.

In early afternoon, the command post committee set new boundaries, after air sampling tests indicated the situation was stable in those areas. At 3:30 p.m., Solicitor General McMurtry announced new borders on the eastern and western boundaries. Five hours later, a further eastern section was opened. The two announcements meant 144,000 persons returned home. However, the rest of the evacuees, living closer to the derailment and in the path of the prevailing winds carrying the deadly gas, would have to wait.

Patients from the Extendicare nursing home in Oakville and the Sheridan Villa nursing home were also returned to their residences.

At the site, workers had been hampered in completely sealing the tanker by another tanker blocking access to it. As a result of an incomplete seal, a small amount of chlorine continued to escape. However, crews registered success in being able to drain the contents of one propane tanker at dawn. It was later hauled away. Meanwhile at the command post, officials were worried that there was a chance that a propane tanker, which had caught fire, might flare up again.

WEDNESDAY

Weary workmen struggled to seal the chlorine tanker and decided to take a calculated risk. In trying to lift and drain another half-empty propane tanker before tackling the chlorine tanker, they gambled that the propane would not explode and further tear open the chlorine tanker.

Stu Greenwood (right) and workers inspect the damage. He was head of the CHLOREP team, formed by the chlorine industry for such crises.



To complicate matters, firemen and command post officials were concerned when a large white cloud of chlorine vapor and water vapor wafted from the derailment site. Pockets of chlorine gas monitored in the deserted area still presented a health hazard for infants, the elderly and anyone with respiratory problems.

During the day, resentment and frustration grew among some evacuated residents, who wanted to return to their homes. The 25-square-kilometre area remained closed, including the two entrances to the Queen Elizabeth Way through Mississauga.

In an effort to alleviate some bitterness, CP Rail offered to pay for hotel rooms for about 1,000 displaced residents, thus relieving the reception areas of some strain and tension.

THURSDAY

As crews worked throughout the night and early morning to patch the leak, an estimated 20 to 30 kilos of chlorine were escaping each hour. The steel patch could not be fitted tightly over the rupture. It was supplemented by a neoprene air bag pressed over the opening by a timber mat and secured by chains. This virtually sealed the tanker, and officials could announce that there was little leakage. Between 7½ and 10 tons of liquid chlorine remained in the tank since most of the 90 tons of chlorine had apparently been sucked up into Sunday's giant flames, and the resulting chlorine gas had been dispersed harmlessly over Lake Ontario. Technical experts explained to the "think tank" meeting that a slushy ice mixture of chlorine and water had built up inside the tanker from water poured in by fire hoses. The mixture formed a layer over the liquid chlorine, complicating the removal of any remaining chlorine and delaying this phase of the operation. Scientists worried that this layer of ice might break up and fall into the liquid chlorine, exposing it to the air. However, it was decided that pumping would not start until favorable winds prevailed. The pumping started at 11 p.m.



The steel patch over the hole was supplemented by an air bag and timber and secured by chains.



With the hole virtually sealed, removal of the chlorine began.



A worker walks among the wreckage while crews using cranes clear the site.

Earlier in the day, Solicitor General McMurtry announced on behalf of the command team that the remaining 72,000 could not return that night. The end would depend on the removal of the chlorine.

FRIDAY

Generally, the transfer proceeded smoothly. As a precautionary measure against the spread of small amounts of chlorine emitting from the tank after the patch was fitted, firefighters set up monitors in a fog mode downwind from the chlorine tank to ensure that any remaining chlorine in the air would be captured by water and drawn to the ground. The problem involving the layer of ice was resolved by applying a liquid line below the ice and a vacuum line above it. X-rays were taken to measure the levels of the tank car and truck during the pumping operation. By noon, most of the chlorine had been pumped into trucks and shipped safely away.

Throughout the pumping, air monitoring continued. Their tests showed no dangerous pockets of chlorine. By 3 p.m., 37,000 persons of the remaining 72,000 were permitted to return home. But the 35,000 residents living closest to the derailment and the first to evacuate, waited another four hours. Finally the boundaries were lifted.

While CP Rail under the supervision of the Canadian Transport Commission, a federal government agency, removed wreckage, the chlorine tanker was not disturbed until the liquid chlorine had been removed and the empty car purged.

At 7:45 p.m., the city was reopened. Police removed road blocks. Only the derailment site remained out of bounds. By late evening, the last reception centre was closed and by midnight, Metro Toronto police, the provincial police and RCMP had finished their duties.

AFTERMATH

On Monday, November 19, the chlorine tank was finally emptied and the clearing of the tanker started.

On Tuesday, November 20, the last ambulance on standby was dismissed.

On Wednesday, November 21, the last piece of fire equipment was removed.

The Police

Symptomatic of the police handling of the week-long derailment crisis was their initial response. It was quick, unhesitating and well-executed. While the Peel Regional Police force switchboard was filled with incoming calls a minute after the derailment, officers on patrol and members on duty in a division close to the level crossing were immediately aware of the crash. Within a minute, the first officers were on the scene. One of those was startled to find a well-dressed couple frantically fleeing down Mavis Road. He yelled at Ron and Kay Dabor to keep running. They had been waiting at the crossing a few minutes earlier for the train to pass. Suddenly, Mrs. Dabor noticed sparks and screamed at her husband to back up and get the car out of the way. The new Lincoln Continental lurched backwards into a ditch, where they leaped out and started fleeing. An explosion flattened the Dabors and the policeman. Then their paths parted. After the couple returned home, Dabor telephoned police to ask if his car with a \$10,000 fur coat flung over a seat had been retrieved. With a touch of ironic humor, the officer replied that the safest place in the world for the car was in the middle of the security-tight site. The next day, the car and coat were returned to the Dabors.

Meanwhile at police headquarters in Brampton, all officers going off duty at midnight were ordered to stay. Recognizing it as a major emergency, the force implemented its disaster plan.

Under the umbrella disaster plan, communications staff at headquarters began to call senior officers, who have received specialized training in various emergency situations. The plan calls for a senior officer to be in charge of duties involving the intelligence bureau, regular force personnel, news media, staff requirements, administration and investigation. One officer would become the on-scene commander but all officers still report to Police Chief Douglas Burrows.

Each senior officer must be aware of the responsibilities of the other six officers and keep in close contact with them so maximum co-ordination can



be achieved. Besides co-ordination, the plan stresses communication, control, accountability and responsibilities during the emergency.

A decade ago, the need for sophisticated emergency operations plan became clear. A massive natural gas explosion in a small community near Toronto International Airport killed one person and destroyed a number of businesses and store apartments. About 200 persons were evacuated from their homes for an eight-to-ten hour period. A year later in 1970, the crash of a DC-8 jet in an area northeast of the Toronto airport confirmed the need. All 108 persons aboard were killed. Since the

Senior officers from the Ontario Provincial Police and the Peel Regional Police conferred during the week. From left to right are: Assistant Commissioner J.W. Lidstone, OPP Field Division, Staff Superintendent Robert Collins of Peel Regional Police, Superintendent William Snarr of Peel Regional Police, Sergeant-Major John McCabe of OPP London Division, and Traffic Sergeant A.M. Wilkinson of OPP Downsview.

airport is within the Peel force's jurisdiction, other potential disasters at the airport loom as the airport becomes busier.

In 1974, police services in Peel were combined when five small municipalities were amalgamated under the Ontario government's plan for streamlined regionalized communities in rapidly-expanding areas. The newly-formed Peel Regional Police force covers the cities of Brampton and Mississauga and the town of Caledon. The area with a population of 437,000 is bounded by Metropolitan Toronto on the east, Halton Region on the west, Lake Ontario on the south and Dufferin County on the north.

With this regionalization, it was then possible to assign senior police personnel to refine and coordinate the disaster plan with other agencies, including hospitals, ambulances, volunteer agencies, Toronto International Airport and boards of education. Tested in mock exercises, it has also been used in tragic real-life incidents. In 1975, the plan was put into effect when a high school student shot 14 fellow students, killing one teacher and two students before committing suicide. Again it was placed in use when 3,000 persons were evacuated in early morning hours after an arsonist set a fire at a lakefront oil refinery causing massive explosions. In retrospect, the 18-hour refinery emergency appears to have been a practice round for the derailment. That same year, a DC-9 crashed at Toronto International Airport, killing two persons and injuring 104 others. Under the Peel force, the emergency involved 12 hospitals, three police forces, on-site medical teams and ambulances. Chief Burrows feels these events provided the Peel force with the opportunity to improve disaster contingency plans. By virtue of their training and experience, police are conditioned to respond under tense situations. But their response to a major emergency or disaster is often spontaneous, leading to a lack of organization and less than efficient use of total police resources. When train 54 derailed, years

of planning and experience from other major incidents created a backdrop.

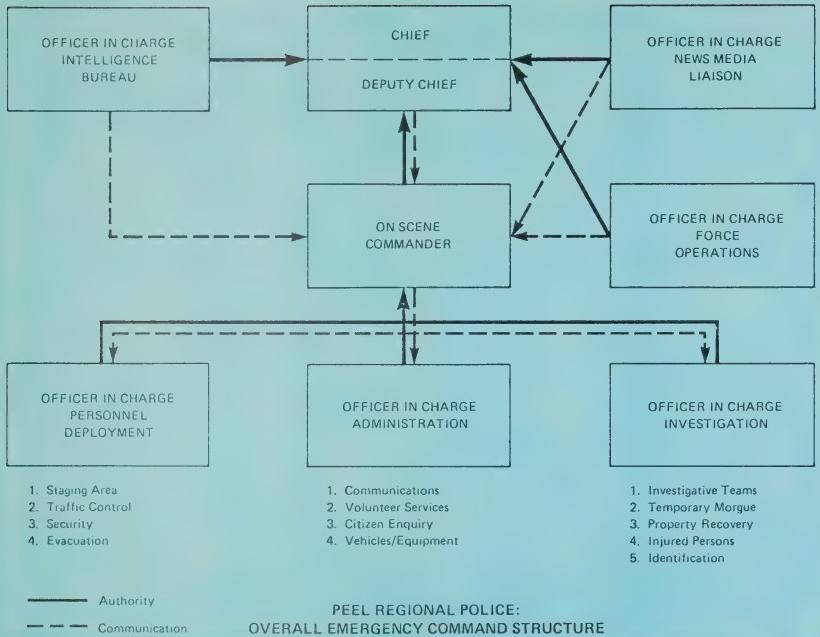
Meanwhile, police staff in the headquarters communications centre ripped open envelopes with names and telephone numbers of senior officers and consulted the disaster manual regularly. Chief Burrows, awakened from a sound sleep, and Deputy Chief William Teggart were called. Hundreds of calls were also made from the communications room. Police staff have been trained to first alert those people, who have the expertise to end the danger. Meanwhile, the police emergency mobile command trailer was dispatched to the

scene so the headquarters communications centre would have direct contact with operations at the fire. The immediate area of a two-kilometre stretch of Mavis Road was sealed off to traffic, and officers now had to deal with swelling crowds of onlookers and traffic.

At the site, police and fire officials recognized within minutes that the train was carrying dangerous commodities. But they had no immediate way to discover the nature and location of the chemicals and volatile liquids. At 12:40 a.m., the train's manifest was obtained from the conductor, but the initial information suggested that



As evacuation borders widened, police direct traffic out of the city.



the chlorine tanker was not in the fire. However, police were reluctant to make assumptions, particularly since chemical irritants were already causing discomfort to those near the derailment. The huge amount of smoke and fire in those early hours made it difficult to see which section of the train had been derailed and the number and damage of the cars involved. The fire and explosion had also destroyed tanker car numbers and skewed the order of the cars. To locate the chlorine tanker, police officers were ordered to make a car-by-car check on foot. Within an hour, emergency staff, technical experts, chemical engineers and officials from the Ontario

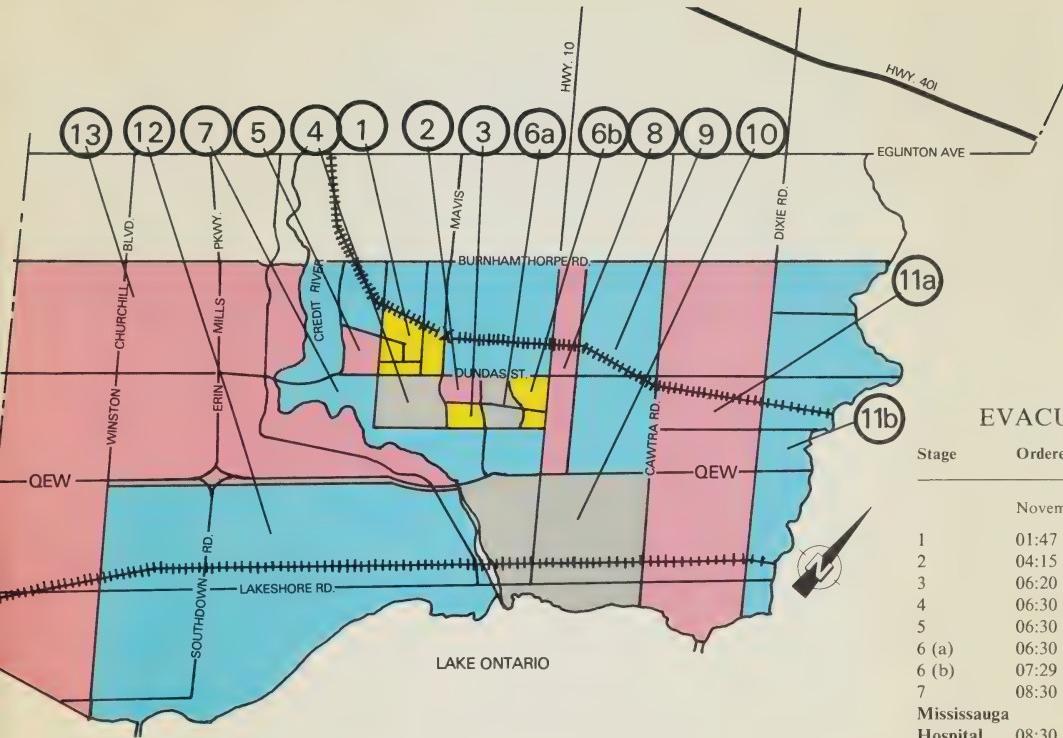
Ministry of the Environment and the Canadian Transport Commission arrived at the fire.

By this time, Chief Burrows had made certain that all areas within a 609-metre radius of the fire had been sealed off, allowing access only to firefighters and others directly dealing with controlling the blaze. When the train's second manifest, brought from Toronto, confirmed suspicions that the chlorine tanker had been derailed near a still-full propane tanker, evacuation of residents had to be started as the winds shifted. Information had been obtained from meteorologists and environmental

scientists, and the visual car-to-car inspection of the train had verified that the chlorine tanker was in the midst of the roaring inferno. At 1:47 a.m., the first of the eventual 13-stage evacuation started.

Chief Burrows issued the first evacuation notice under the police's common law authority to protect life and property. He has explained that evacuation is a preventive measure, based on the best available knowledge from experts dealing with the disaster operation. People can panic. When the risk cannot actually be seen, people either disregard evacuation notices or begin to question their validity. Thus police, as the agency affecting the evacuation, must remain calm but firm. In the early hours on Sunday and with the background of a raging fire, police officers encountered little difficulty in carrying out the evacuation notice. Many residents had already left their homes before police were in the area. Throughout the day, police faced little resistance to the move. People were more interested in the latest developments at the fire and verification of news reports than arguing about leaving. Later evacuations were based on information about windshifts, gauged by the Atmospheric Environment Services of Environment Canada, the federal environment department, and data from provincial environmental monitoring units detecting concentrations of chlorine. Helicopter surveillance made it visually apparent that the wind was drifting gases towards heavily populated areas, including Mississauga Hospital and its neighboring extended care residences.

Meanwhile, teams of constables under the direction of supervisory sergeants undertook door-to-door checks of premises in areas under the evacuation notice. Each house or apartment was clearly marked with an "X" in yellow water proof lumber crayon when it was evacuated. Buses from the city's transit department were assigned to strategic locations within areas being evacuated to assist those without transportation. In addition, ambulances with public address systems were sent



Total Square kilometres: 116.58
 Total Population (excluding hospital-nursing home evacuations) 216,935
 Total patients and residents of nursing home: 1,449

EVACUATION STAGES

Stage	Ordered	Sq. Kilometres	Population
	November 11	Approximate	Approximate
1	01:47 hours	1.32	3500
2	04:15 hours	.38	350
3	06:20 hours	.38	575
4	06:30 hours	1.22	900
5	06:30 hours	.56	4400
6 (a)	06:30 hours	.61	
6 (b)	07:29 hours	.61	6200
7	08:30 hours	12.01	19315
Mississauga Hospital			
Hospital	08:30 hours		
8	09:40 hours	1.90	7618
9	11:10 hours	6.34	28672
10	13:10 hours	8.15	17430
Queensway Hospital			
Hospital	15:40 hours		
11 (a)	17:00 hours	13.84	
11 (b)	17:10 hours	9.05	58280
12	18:45 hours	25.23	38390
13	20:16 hours	20.81	26210
Oakville Hospital			
Hospital	22:55 hours	14.17	5545



A police officer wearing a gas mask halts traffic.

to areas being evacuated to alert residents that transportation for the infirm was available.

Since every Peel police vehicle is equipped with a public address system, officers were sent to areas being evacuated to issue instructions and to areas about to be evacuated to give warnings. They went door to door to advise people to leave. In apartment buildings after warnings had been announced, an officer stayed in lobbies to answer questions and direct people to buses and reception centres. The exact wording of the police message to residents was dictated to each officer so all would have the same message. Police were instructed to tell residents that dangerous gas was on the train, and residents were advised to evacuate immediately to a reception centre. At first, police directed evacuees to Square One, the city's largest shopping centre, but later other centres were suggested. If residents didn't have transportation, buses and ambulances would be available.

Later, police officers were also assigned to special care institutions which house the elderly, mentally and physically handicapped persons and the terminally ill. And as each section emptied, officers, particularly those from detective branches with keen observation abilities, were assigned to security patrol to prevent vandalism and looting. During night and day, an Ontario Provincial Police (OPP) helicopter, equipped with floodlights of 3.5 million candle power and capable of lighting up a city block at about 330 metres, was a highly visible deterrent to housebreaks and other unwanted activities. "Flying over the deserted city was like something out of the movie, *The Omega Man*," said helicopter pilot S/Sgt. Bob Abra. "How often does anybody fly over the QEW (Queen Elizabeth Way) and see nothing moving from end to end?"

From Peel's communications centre, arrangements for evacuation centres were made as officers telephoned lists of names and numbers, compiled for the emergency plan. As a precaution, police alerted the Canadian Coast Guard, which in turn restricted Great Lakes shipping to within two



D.M. Lucas, director of the Centre of Forensic Sciences, (left) and Detective-Sergeant Vic Henderson of the Peel force go to inspect the chlorine tanker.

nautical miles off shore. As well, the Toronto Airport restricted air traffic in a 4.8-kilometre radius of the site and below 2,743 metres. The airport was also on standby notice to shut down if the situation deteriorated.

Within the first two hours, 13 of 24 senior Peel officers had assumed various responsibilities. Within an hour, a command post with an open line to central communications at headquarters was established in a factory half of a kilometre south of the fire. Six hours later, changes in the wind to a southerly direction forced the relocation of the command post to north of the derailment, three-quarters of a kilometre away from the tracks. The command trailer was set up in a most fortunate spot — a Bell Canada test centre. As the operation increased, more of the building's facilities were used, and officials had ready access to telephone staff and lines. This second location greatly assisted the communications aspect of the emergency.

During the early hours, the OPP and Metropolitan Toronto Police force gauged that more manpower would be needed. Both forces had offered help within minutes of the crash. The OPP,

which provides policing to small communities and rural areas unable to provide their own force and operates a traffic control branch for provincial highways, began to mobilize men at two nearby detachments. A senior officer from the OPP formally offered help in the early morning. It was accepted and the force's mobile headquarters was set up at the Bell centre with five telephone lines installed. A civilian radio dispatcher was assigned to that unit for the duration of the week. Senior members of the force operating from the mobile command trailer kept in close contact with the Peel force. The provincial force took the position that they would provide assistance as the regional force directed. During the initial stages, OPP members were assigned by Peel officers. But the logistics of organizing and assigning individual duties became cumbersome. Therefore, the provincial force was put in charge of zones, and this resulted in improved co-ordination of men and resources.

On Sunday, the OPP had committed 154 members to the crisis. Their contribution had begun with 13 vehicles and 17 uniformed officers and had swollen in every ensuing hour. The provincial force aided in later evacuations and investigation of motor vehicle collisions, escorted the vital environmental air monitoring van and patrolled deserted residential streets. One of the force's helicopters provided an airborne view of the crash to police commanders, railway officials, and municipal and provincial politicians.

The Metropolitan Toronto force shared similar tasks with the OPP. By early morning on the first day, 35 members were already helping the Peel force. Communications links with the Peel command post were established, and Metro Toronto mobile units were assigned a common radio frequency. Later on Sunday when senior commanders arrived, Metro Toronto set up another communications post at a nearby shopping plaza. Organization and assignment of force members and information was circulated from



Peel and OPP officers try to deal with problems of a worried woman at a roadblock.

these mobile units.

Like the OPP, Metro Toronto members assisted in traffic control, manning checkpoints and assisting in resident evacuation. As well as regular officers, the force activated its auxiliary force, and 117 members were supporting Peel members by late Sunday morning. And during the transfer of patients from the Mississauga hospital, Metro Toronto members escorted ambulances to Toronto hospitals. Often this involved force members, who were not directly assigned to the derailment.

During Sunday afternoon, the force commanding "O" division of the Royal Canadian Mounted Police (RCMP), the federal police force, also offered help in securing evacuated areas. In accepting the offer, Chief Burrows asked that RCMP officers appear in uniform. For many RCMP members who are undercover agents, the wearing of a uniform was an odd occurrence. Other police forces could easily tell a RCMP officer by either his longish hair, beard or uncomfortable look worn while in uniform. Throughout the week, the RCMP provided 52 members a shift and sent senior officers to supervise their staff.

RCMP officers shared duties at roadblocks and on patrols in evacuated areas with other police forces. One officer noticed movement in a home in

Port Credit, a southern section of the city. The officer tapped on the door, interrupting Deputy Fire Chief Arthur Warner, who had slipped home one day for a change of clothing and to raid the refrigerator. "I'm with the Royal Canadian Mounted Police," the shabbily-dressed officer identified himself. "It's an evacuated area. What are you doing here?" Warner hastily explained that he was the city's deputy fire chief and was home to pick up a few things. The officer left.

With four forces receiving orders, communications problems inevitably occurred between various police communications trailers and officers on duty points. Peelsupervisors tried to work closely with commanders from the other forces but breakdowns happened. Often Peel officers would receive information on their radios before the other forces had received their orders. Unfortunately, none of the four forces shared the same radio frequency. Occasionally, an officer from another force would be radioed an order which would be different than a Peel order. Following several cross-purpose orders, Peel supervisors were assigned to circulate up-to-date information among perimeter checkpoints to make sure accurate information was received.

This care for accuracy at the roadblocks, particularly at perimeter points, was vital to traffic



A Peel officer at a roadblock selects a snack from a travelling canteen.

control. At peak, 186 roadpoints had been established after 218,000 persons had left. Since three major highways, the Queen Elizabeth Way, Highway Five (Dundas Street) and Highway Two (Lakeshore Road) which run east and west through Mississauga were closed for six days, normal traffic coming to and from Toronto had to be redirected. Teams of officers were assigned to traffic points to untangle traffic jams. Rush hours were unparalleled. The regular two hours was doubled to four hours each morning and night. Some disputes arose at perimeter lines during the latter stages of the week, but conciliation teams of Peel officers were used to trouble shoot these problems and attend to other serious concerns of evacuees.

Undeniably, the most unpleasant task of policing was at the roadblocks. When possible, Peel officers with local knowledge of streets were assigned with out-of-town force members, and each Metro Toronto and OPP member was given a road map of the city. However, all officers were instructed to err on the side of caution. Some persons were escorted by police to their homes to pick up prescriptions and to feed pets. Police (usually cadets or junior constables) were assigned to the humane society feeding program for pets on Tuesday.

After completing their shifts, Peel senior officers asked their officers about problems during the shifts, which had been extended to 12 hours a day for all forces. One problem arising in the early stages involved the maintenance of vehicles. Some out-of-town members had arrived with little gasoline to operate their cars. Thus, the Peel force sent mechanics to each roadblock to check vehicles for mechanical fitness and supply gasoline.

In all its dealings with the public, the Peel force has stressed good police-community relations. An officer was assigned to each evacuation centre, as a security measure, and senior police officials would visit each centre once a day to report developments from the site. This gave the evacuees a feeling of reassurance when the information was related by an official source.



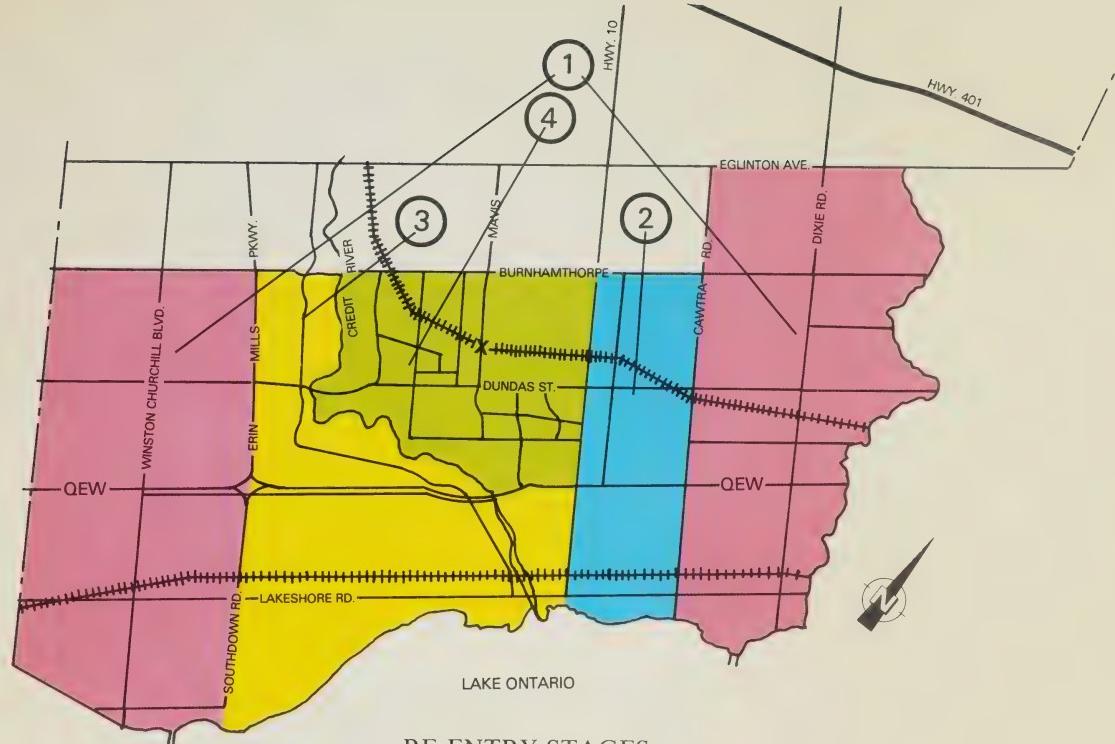
Public relations efforts intensified in the final three days of the evacuation after about two-thirds of the residents were permitted to return home. Isolated incidents occurred at roadblocks when residents tried to re-enter evacuated zones. Teams of officers also visited hotels and still-operating reception centres to continue providing first-hand information about site developments.

Finally when the last evacuees returned home about 140 hours after the derailment, most found their homes in the same state as on their departure on Sunday. Police control at roadblocks and intensive patrolling had been successful. The small minority who refused to leave on Sunday caused few problems and tended to stay out-of-sight when patrol cars drove down empty streets. In the end of the six-day period, 135 property offences were reported, substantially less than the number in a normal five-day period. Many of the offences were committed by the same persons or groups.

Without doubt, much of the success of the police role as the co-ordinator of the emergency was the manpower, co-operation and orchestrated effort of the four forces. The Metro Toronto force provided

a daily average of 227 men, ranging from a high contribution of 331 on Monday and a low of 239 on Friday. The OPP's lowest participation was 154 members on Sunday and a high of 207 on Thursday. They pulled officers and units from districts of London, Mount Forest, Burlington, Barrie and Peterborough. Meanwhile, the Peel force provided the remaining numbers, bringing the daily total of 600.

But all officers had one trait. They contributed their skills in the presence of potential danger without undue concern for their own personal safety. This was particularly illustrated by Captain Robert Ratcliff of the Mississauga Salvation Army. He remembered leaving the Army's temple on Monday with volunteers after an order that the area should be cleared. The situation was so serious that the police officer, who had relayed the notice, was only receiving orders on his radio instead of the usual system of hearing all dispatcher instructions and unit replies. "This system is only used in extreme emergencies," Captain Ratcliff recalled. "As we drove down the deserted streets, I was never so glad to get out of a place, but I thought of the man we had just left—with a gas mask in his car and not knowing what was next."



RE-ENTRY STAGES

Stage	Ordered	Sq. Kilometres	Population
1	November 13 15:10 hours	59.75	96,635
2	November 13 16:50 hours	13.18	47,920
3	November 16 14:55 hours	25.82	37,140
4	November 16 19:40 hours	19.98	35,240

The Firefighters

The cozy scene on the third-floor squad room at Mississauga Fire Department headquarters could have been easily drawn by U.S. artist Norman Rockwell. Most firefighters were relaxing—either watching television or chatting. Most thought the evening's excitement—a blaze caused by an overheated stove in a townhouse—was over.

Firefighter Kenny Wright saw a blinding light while looking through a window in the third-floor kitchen. “The whole city’s on fire,” he yelled, still staring at the massive flames more than a kilometre away.

It sounded like the start of some good-natured kidding, but Captain Ronald Swindells realized immediately it wasn’t a joke. “His eyes were that big,” Swindells recalled while forming two huge circles with his fingers and thumbs. “We all jumped up and began heading for the trucks.”

District Chief Ross Kelly yelled to dispatcher John Gwilt. “Send everything from headquarters...everybody head for Mavis Road.” Kelly had no idea what was burning but instincts told him it would be a major job. Meanwhile, Gwilt pushed open electrically-operated fire hall doors and flicked a switch which froze the corner traffic lights to give fire trucks the right of way.

As the firefighting apparatus rolled from the station, Gwilt still hadn’t received a single telephone call alerting the department of the explosion. The first message came over a telephone line, which links the city’s nine fire stations. A firefighter at the station at Dundas Street and Erin Mills Road reported: “There’s a fire east of the station and she’s really going.” Telephone alarms started flooding in. The first call came from a dispatcher at the Mississauga Transit office. “There’s some sort of explosion on Mavis Road,” the man said. Gwilt pressed the alarm button to alert the firefighters at the Dundas and Erin Mills station. “Attention. Aerial 7 and Pumper 7...report of an explosion on Mavis Road.”

Meanwhile, fire vehicles from headquarters

went in different directions with one set approaching the fire from the north and the other from the south. This allowed firefighters to battle the massive fire from both directions.

District Chief Kelly directed firefighters to set up deluge nozzles to protect exposures and try to contain the fire. Because of the various explosive vapor-producing substances, firefighters were ordered only to confine and control the flames. If the massive flames were extinguished, problems would have arisen with flammable vapors all over the area. But the flames were swirling hundreds of feet in the air and the whole wreckage had been ignited. Thick black smoke was billowing into the sky, and it is now believed the flames were being fed by styrene and toluene.

Kelly ordered heavy streams fed with four-inch lines or twin 2½-inch lines. He also recommended that all firefighters stay well back after the remote or portable deluge nozzles were in place. However, the firefighters couldn’t stand back. They had to make a stand. Wherever possible vehicles were placed behind buildings to lessen the danger from explosions, and lines were laid by hand up to portable deluge sets. Kelly then requested that senior fire officials be called and more equipment sent.

Fire Chief Gordon Bentley was in bed fighting the flu when his telephone rang. “It’s me Chief,” said the dispatcher. “We’ve got a train wreck...it’s exploded. We need you down here.” As he drove from his home in Streetsville, north of the derailment, to headquarters, the chief began mentally to review his department’s emergency plans. Fortunately a few weeks before, Mississauga firefighters had viewed a film about the dangers of chemical fires. But his duties would be to set up a command centre to handle the overall firefighting operation and maintain protection for the rest of the city. On his way, the chief received a quick outline of the equipment at the scene. He also

checked to make sure other senior officers and off-duty staff had been summoned.

At the site a few minutes after arriving, Kelly yelled into his portable radio, warning other firefighters. “She’s going to blow. Pull back.” A BLEVE (boiling liquid evaporating vapor explosion) occurred shortly afterwards. Meanwhile, the other vehicles approached the fire from the north side, before Kelly’s broadcast. Swindells knew then it was a freight train and stopped the trucks about 330 metres away, fearing explosive cargo. He ordered his driver to back the pumper down the roadway to within 166 metres of the inferno. “I wanted my rear end facing the fire so we could beat it out of there if necessary.”

His firefighters were laying lines close to the fires when the first BLEVE erupted. Some firemen dove under the truck to escape the flaming eruptions and others ran behind buildings. The heat was so intense that Swindells thought it was necessary to ply water on the truck to prevent damage. As well, a fog nozzle was set up in the middle of Mavis Road to protect men and equipment from the roaring flames. Despite interruptions by BLEVES, firefighters on both sides set up master streams directing water to control the blazing wreckage.

Meanwhile, Chief Fire Inspector Cyril Hare arrived at the scene just behind the first truck. He grabbed his turnout coat and was pulling on his boots as firefighters were hooking up hoses to hydrants. Hare helped firefighters set up hose lines in an attempt to cool the flaming tankers.

As Hare assisted, District Chief Kelly continued to survey the situation and determine the necessary firefighting techniques. “My concern was to keep the fire confined to one area...to get major lines to contain it...and try not to have it

Minutes after the derailment, firefighters arrived at the scene, connecting hoses to direct water at the blazing wreckage.



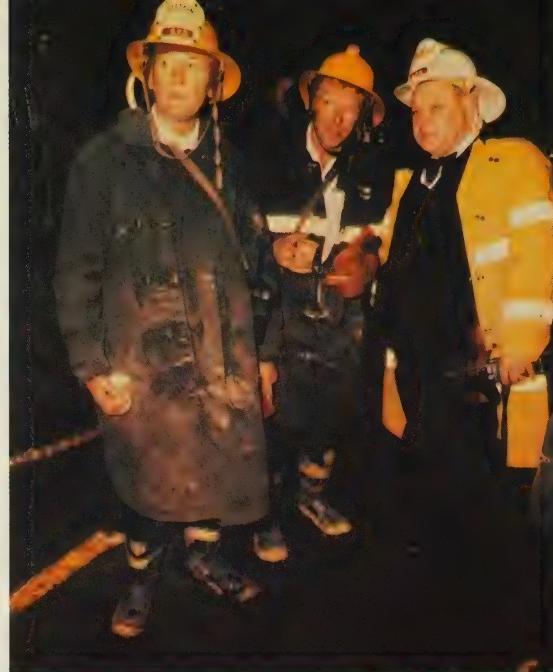


At its peak, the fire produced flames reaching hundreds of metres in the air.

move into the buildings." Kelly said he also had to get men in and out as quickly as possible. Trucks were within about 150 metres of the tankers, and he knew they would have to be moved back more than 660 metres to be out of the danger zone. He also knew this was practically impossible.

About 4,000 metres of hose was eventually used to fight the flames, but the most difficult problems occurred when it had to be moved by hand many times during several days. The lines were first placed to protect buildings and cool tank cars, the liquid contents of which were being boiled by the heat. Firefighters found flames had jumped and set fires in some nearby buildings and were threatening to ignite other structures. But they kept moving in until the blaze was fully contained and hoses were located only for changes in the wind direction, which occurred frequently.

Within an hour of the derailment, Deputy Fire Chief Art Warner arrived to take control of the on-site operations. The deputy had been at his son's wedding reception in a nearby community when a guest pointed to a giant fireball several miles away. Deputy Warner tried to telephone the fire department's switchboard, but all the lines were jammed. He finally got through on the chief's private number. "I don't know what we've got...just get here as quickly as you can and bring any firemen with you," blurted the dispatcher. The deputy didn't know what was burning but he began rounding up firefighters at the wedding for duty.



Three senior Mississauga fire department officials discuss firefighting techniques early Sunday morning. Left to right: Captain Ronald Swindells, Captain Harold Taylor and Deputy Fire Chief Art Warner. The deputy chief, wearing Chief Bentley's coat and hat, arrived at the fire directly from his son's wedding reception. Warner wore the rented tuxedo throughout Sunday.

When Warner arrived at headquarters, Chief Bentley was already there. "I want you at the fire," instructed the chief. "I have no gear," Warner said, his hands motioning to his rented tuxedo, which he was wearing. "Take my car," the chief said. "My hat and coat are in there."

Warner plunked the chief's white helmet on his head, but it was impossible for him to button the chief's coat around his 240-pound frame. Warner began directing on-site fire activities with the black tuxedo and a white ruffled shirt peeking out from the protective coat. "You're the best-dressed firefighter in Canada," quipped Fire Chief Bryan Mitchell of the neighboring Metropolitan Toronto borough of Etobicoke, when he met Warner a few hours later.

A wall of fire greeted Warner at the site. Flames were still shooting up hundreds of metres into the air. Warner took over from Hare, who was assigned to assist at the temporary command centre. Hare's first duties involved deciphering the train's cargo manifest and determining difficulties facing emergency crews. Later he assisted Chief Bentley during various on-site command post meetings and issued press releases about the department's role.

Shortly after Warner took charge, firefighters detected fumes from burning materials. Then came a warning of polychlorinated biphenyls (PCBs). Warner asked for all available breathing apparatus.

However, it was quickly learned that PCBs,

deadly chemicals used mainly as coolants in electrical transformers, were not burning in the fire. The chemicals accumulate in the human tissue and have been found to cause health problems, such as birth defects, nervous disorders and cancer. The scare of PCBs meant a double horror in Mississauga. In recent months, city council had been fighting a plan to burn PCBs in the city.

At this point, one of the toughest assignments evolved. Following the first explosion, Kelly had encountered a railway worker carrying a copy of the train's manifest. In the dark and adjacent to the flaming train, it was little value to him because he couldn't make out the manifest. It appeared to be just a jumble of numbers and provided no information about where the railway cars were located. As well, the railway employee didn't have any hazard cards to detail the dangerous cargo and firefighting methods needed.

At headquarters, Chief Bentley's first concern was to obtain another manifest from CP Rail. The

second manifest was delivered about 1:30 a.m., but it was still necessary to get as close as possible to the blazing cars and record the numbers. This was the only way to pinpoint the chlorine tanker. Police and firefighters assisted each other in this dangerous task. But it was not until almost three hours after the derailment that the fire department learned definitely that a chlorine tanker was in the wreckage.

Within three or four hours after the first explosions, firefighters were in control of the fire. Deputy Warner recalled he was relieved when he heard that police had sealed off the area. "I had less to worry about, knowing the citizens were away."

Warner was assisted in reporting back to headquarters by Assistant Deputy Fire Chief John Hickey at the fire. He established radio link from his car and estimated the potential effect the wreck would have on the community. He ordered deluge units to protect some buildings, just south and west of the derailment. Plans were made to maintain

cooling lines on the tankers. After the fire was controlled on Sunday, Hickey performed administrative duties, such as assuring that fire stations were fully staffed throughout the emergency and co-ordinating requisition of supplies and equipment.

Hickey had difficulty in finding firefighters, who had been evacuated from their homes. Fortunately all staff had left telephone numbers where they could be reached, but each person had to be telephoned and told where they would be required for duty. Firefighters were assigned to outlying stations after they had worked at the scene. This gave many staff some time at the derailment and allowed everyone an opportunity to help.

For senior officers, it was not until Wednesday night that most could rest at home. On Sunday, Deputy Warner finally headed to the fire station office late in the evening. He stripped off his clothes, showered and called his wife. Then he curled up under his desk for a couple of hours of



Dawn breaks at the derailment site.



Aerial shot of the fire and hoses.

rest. He said it was the only place he could get some sleep!

Later in the week, he did slip back to his Port Credit home to pick up a few things, including steaks, eggs and coffee. "It was the best meal we'd had in days," he said. In addition, he returned the tuxedo, rented for the wedding. The deputy said he packaged the clothing in a large paper bag and left it at the store. "I never heard another word about it," he said. "But I am sure it needed cleaning."

In the early hours of Sunday, Etobicoke Chief Mitchell joined Bentley at headquarters. "It was good to have someone to exchange ideas with," the chief said. "It helped reduce the pressure and was certainly appreciated." Chief Mitchell also brought a member of his alarm room staff to Mississauga and later provided pumper and ladder trucks to fill equipment gaps at two stations. That equipment was used in seven minor alarms during the 36 hours at the stations.

Chief Mitchell said his department was receiving calls at the rate of one every eight seconds and he knew the Mississauga department would be swamped. In fact, Mississauga had plugged in extra lines to handle the volume of calls, mainly from anxious citizens wondering whether they were in immediate danger.

Other fire departments also helped. The Oakville department sent breathing apparatus and a supply of air bottles and offered help in answering Mississauga's alarms in the city's west end. Brampton fire department offered equipment and helped later in supplying communications equipment. Other surrounding departments also sent breathing equipment and air bottles.

As the first off-duty staff arrived at headquarters, Chief Bentley used them to man telephone and complete callback procedures. Using direct telephone lines, the dispatch centre set up links with both the Peel Regional Police



force and the Halton-Peel Ambulance Service to co-ordinate emergency services. Moreover, the chief alerted the Transportation Emergency Assistance Program (TEAP), an emergency crew established by the chemical industry to provide information and assistance in handling transportation difficulties. The chief knew it would be some time for a crew to come from Niagara Falls, about an hour's drive, so he asked a number of local chemists to come to the scene and provide expert knowledge when the train's contents were discovered.

At 3 a.m., on Sunday, Chief Bentley toured the fire scene. At that time, building fires were extin-

Chief Fire Inspector Cyril Hare (right) and Fire Chief Gordon Bentley (centre) discuss developments at the site with other officials at the command post.

guished and a heavy flow of water was being applied. He recalled that most hose lines were set up after the third barge and were pumping about 3,000 gallons a minute using six unmanned deluge nozzles. Three hand lines were used for putting out fires in adjacent areas. Later firefighters set additional portable deluge units and the flow was increased to about 5,000 gallons a minute from 10 master lines. The chief made several trips to the site throughout the night and discussed the crisis with senior officials and politicians.

During the week, the department's fire prevention and training branch performed the necessary and useful functions of servicing equipment used at the site. They filled air bottles and cleaned hoses under the direction of the branch's director District Chief Robert Naysmith, who spent the first night, involved in firefighting activities on the westerly portion of the fire. The rest of the week, he directed the gathering and rehabilitation of equipment and the arranging of loan materials and their subsequent return.

One of the problems in this duty was finding adequate fuel for vehicles because the department's supply was located in the city's works yards in the fire zone. Hydro lines were down and no power was available to pump fuel from underground storage tanks. However, Chief Bentley arranged for a fuel truck from a local refinery to supply vehicles in the emergency cleanup. Pumps were obtained for the fire department's tanks and the four-wheel drive truck handled the deliveries from the bulk refinery truck to the actual vehicles. More than 6,000 gallons of fuel were required during the operation.

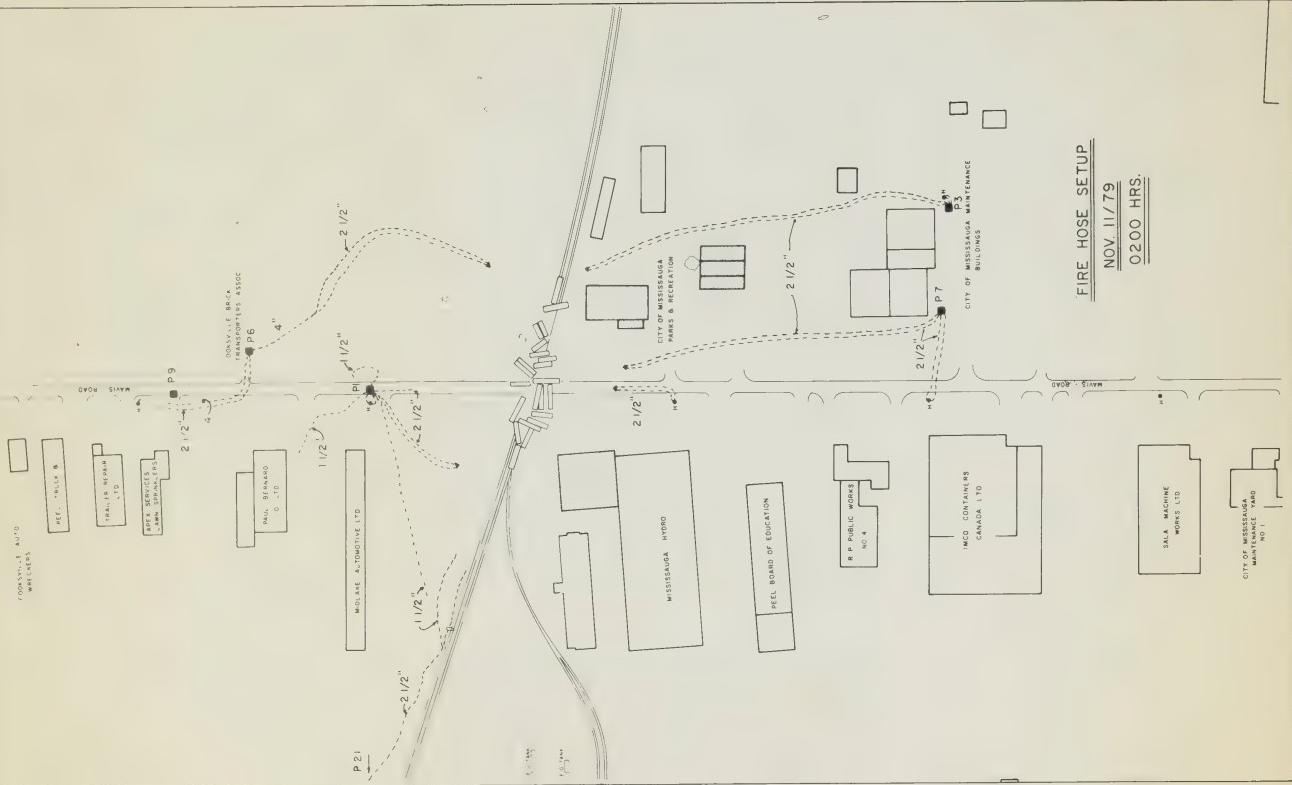
As well, mechanical difficulties were minimal. Batteries on three of the four vehicles began boiling from overcharging because of a malfunction of regulators, fouled by corrosive fumes from the fire. The problems were temporarily corrected by putting on the vehicles' lights and allowing a small stream of water to pour



Above: An aerial photograph of hoses in the latter part of the week.



Left: Firefighters and other workers wore breathing apparatus near the fire. The only injuries at the site occurred on Thursday when eight firefighters collapsed from chlorine inhalation. One firefighter was admitted to hospital for treatment.



Some services provided by the Fire Department

over each battery to keep it cool. And as trucks and equipment were relieved from duty, they were steamcleaned and mechanics replaced ignition wires, spark plugs, air filters, oil filters and engine oil. Radios were removed, cleaned and serviced and dry hose was reloaded.

But the week did take its toll on some equipment. Chrome-plated parts on equipment and some working parts did seize up. Many nozzles and other equipment had to be rechromed and rebuilt. The department lost about 1,800 metres of hose because of prolonged exposure to various chemicals, which damaged outside jackets. As well, experts estimated that the life expectancy of the remaining hose would likely be reduced by 10 to 80 per cent, depending on the amount of exposure. During the 10-day operation, the fire department used more than 1,300 metres of four-inch high volume hose and more than 2,500 metres of 2½-inch hose. Additional hand lines were required of 1½-inch hose and a total of 500 metres was needed. The lines were gradually decreased during the 10 days, and 17 million gallons of water were applied during the firefighting and cooling operations. Firefighters had to bring the blaze under control and then permit a controlled burn as the gases escaped from the damaged tankers. In the event a spark touches off another fire, firefighters were on standby during the removal of the remaining products in tank cars. Firefighters worked closely with the chemical team, which patched up the leaking chlorine tanker. When the chlorine was finally removed from the tanker, the fire department assisted in clearing the tanker with water and watched with relief when the tanker was finally lifted on to a rail-way car and pulled away.

Right: Hoses continued to spray tankers despite cold weather. Extreme Right: The face of firefighter Bob Smith shows the tension and weariness of the week.

1. Provided initial fire attack to confine the fire to the wreck.
2. Provided cooling lines to protect unruptured tanks.
3. Provided cooling lines to control the burn-off process.
4. Provided at all times master fog streams downwind of the accident to affect some washdown action if a chlorine cloud occurred.
5. Checked out buildings for fire and damages to natural gas lines.
6. Provided help to Hydro Mississauga and the Region of Peel in getting necessary equipment out of the fire area. Later helped in arranging for staff to enter and get necessary supplies and equipment to maintain and service other areas of the city, as well as repair fire site damage.
7. Arranged and maintained area flood-lighting each night.
8. Maintained emergency fuel supplies for chlorine vacuum trucks and neutralizing trucks.
9. Arranged and supervised building of temporary access roads and the covering of chemical ponds with sand.
10. Provided foam coverage of chemical pools to stop vaporization.
11. Arranged for the natural gas cutoff and the eventual line testing and the startup services when the emergency ended.
12. Provided extensive resource information and manpower and materials for the propane and chorine removal.
13. Provided water protection lines for propane removal and the purging of all tanks.
14. Provided water protection and foam lines for cutting torch operation and the pulling apart of the train wreckage.
15. Provided cooling streams constantly on the chlorine vacuum trucks and pumps, as well as caustic tankers used to neutralize pumped vapors. This operation was in effect for several days on a 24-hour basis.
16. Assisted in the neutralizing and dilution of the caustic in the tankers.
17. Provided all necessary breathing air for the Dow Chemical team, as well as any other emergency groups.
18. Provided a senior staff member at all policy and decision-making meetings at the command post and provided resource information and advice to that group involved in the fire.



The Environment

Shortly after firefighters and police arrived at the scene of the derailment, it was quickly realized that this was no ordinary fire. Experts must be called to fill in gaps about the fire's chemical make-up. At 12:40 a.m., the emergency off-hours duty officer at the Ontario Ministry of the Environment was notified of the fire by the ministry's 24-hour environmental spills and emergency response service. Immediately district staff was summoned, coming to the site at 1:20 a.m.

Along with CP Rail officials, police and firefighters, ministry staff examined the train's manifest. The leaking chlorine tanker was identified as the most dangerous factor, and ministry staff with other experts advised police of the potential toxic emissions and possible results upon the nearby communities.

Early in the emergency response and assessment, it became clear that the specialized knowledge of air experts would be necessary to assist decision-making through the emergency period. Full technical support by the ministry's air resource branch was soon organized. The first mobile air sampling/analyzing unit (MASA) arrived by 10 a.m. and immediately monitored the surrounding area.

A few hours later, a program to measure chlorine and other compounds began in the area around the derailment with two Trace Atmospheric Gas Analysis (TAGA). One of the TAGA units was owned by the environment ministry, which was using it in Mississauga to test its ability to monitor polychlorinated biphenyls (PCBs) in the usual gases and solids of plant emissions at St. Lawrence Cement Co. To place it in working order for chlorine monitoring, the housing around the van was removed as well as blocks under the van. A glass sampling line to the stack breaching was also disconnected.

For the other system, owned by the federal department of energy, mines and resources, less had to



TAGA vehicle monitored chlorine in the air.

be done. Sciex Inc.—the developer and builder of the TAGA units—agreed to lease the second unit to the environment ministry and provide staff to operate the two units. Fortunately, it had just returned from an extensive monitoring program in the United States to characterize a mixture of gas. In North Carolina, it had been programmed to detect chlorine. Thus, it was possible to establish an approximate response factor for chlorine until more accurate calibration could be performed. However, both vehicles were hastily prepared and restocked and systems were tested. After receiving instructions from the ministry, scientists operating the systems began to monitor at 2 p.m. on the first day.

The two TAGA units in their large white vans were to ensure that citizens and emergency personnel were not exposed to hazardous levels of chlorine. After measuring maximum concentrations of chlorine in the plume—a feather-shaped formation of an air mass—the units would then report their readings to the command post. By monitoring the spread of chlorine and other potentially hazardous gases away from the site, the units told the command centre of any possible dangerous levels.

The TAGA units also investigated citizen reports or concerns about strange odors or suspected pockets of chlorine. They also searched for the possible presence of other compounds in the

plume, which might have come from the ruptured tanks or were produced by reactions between escaping chemicals. As well, all this information was reported to ministry officials, who passed it on to command post decision-makers.

Monitoring of the plume was of prime importance for determining evacuation areas and later return of evacuees. Monitoring was performed by crossing the plume downwind of the site. Local weather data, such as wind speed and direction, was obtained from the ministry to track down the plume when the wind shifted. During periods of low wind, the units read air quality levels at the site to ensure that no unknown outflow of chlorine was coming from the tanker.

Thus the use of the two TAGAs in tracking and patrolling the air plume at various distances enabled staff to plot the plume's location and its reduction. Generally concentrations of chlorine were below 400 micrograms or 0.13 ppm (see charts).

As well at the site, four Ministry of Labour staff also monitored air samples, using equipment for measuring air quality in industrial plants. Although less sophisticated, the labour ministry equipment supplemented the TAGA readings. Later labour ministry instruments were moved to evacuated areas for further readings.

While air monitoring was of prime importance, weather information was needed as urgently. Dr. Lou Shenfield, meteorologist in the air quality and meteorology section of the ministry's air resources branch, developed a weather information service for the command post in co-operation with the Atmospheric Environment Service of the federal agency Environment Canada. Each service added a meteorologist to the staff at Toronto International Airport weather office and linked the weather office with the command post by telephone hot line. As well, the federal service supplied a crew at the derailment to release radio-

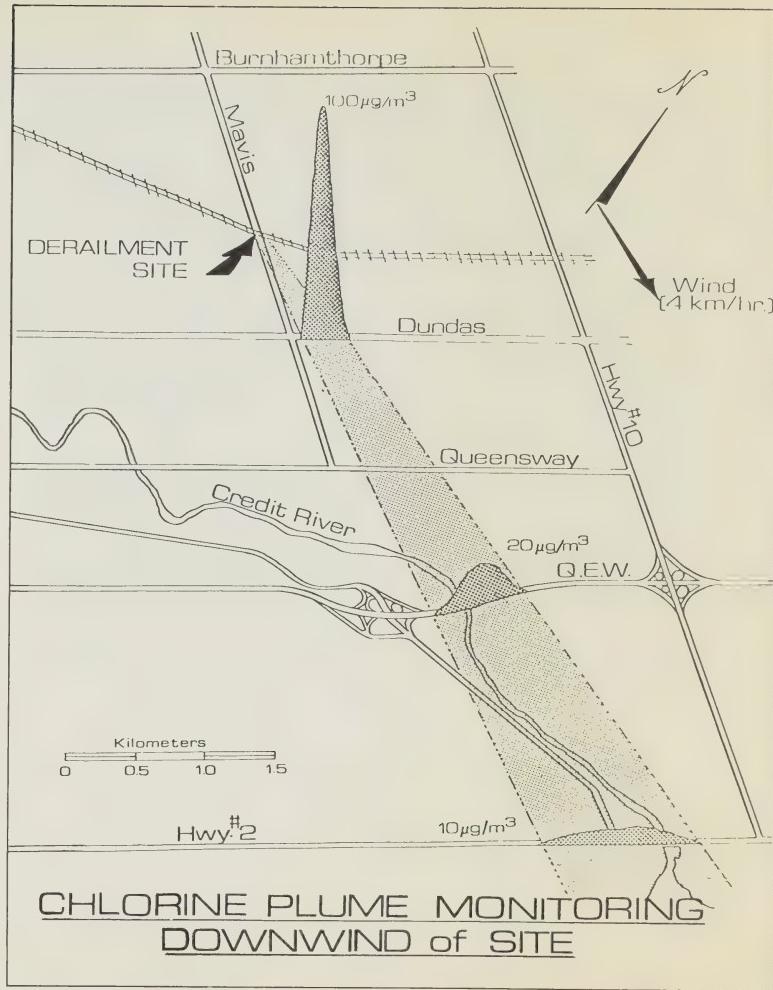
equipped balloons and track their paths downwind, enabling provincial ministry staff to predict plume paths.

Two days after the derailment, an air monitoring unit was converted into a small weather station at the site with complete facilities to provide continuous wind speed and direction at a 10-metre level. In addition, information from other Ontario weather stations was obtained from the weather computer and used to detail weather maps. It also directed TAGAs to the plume.

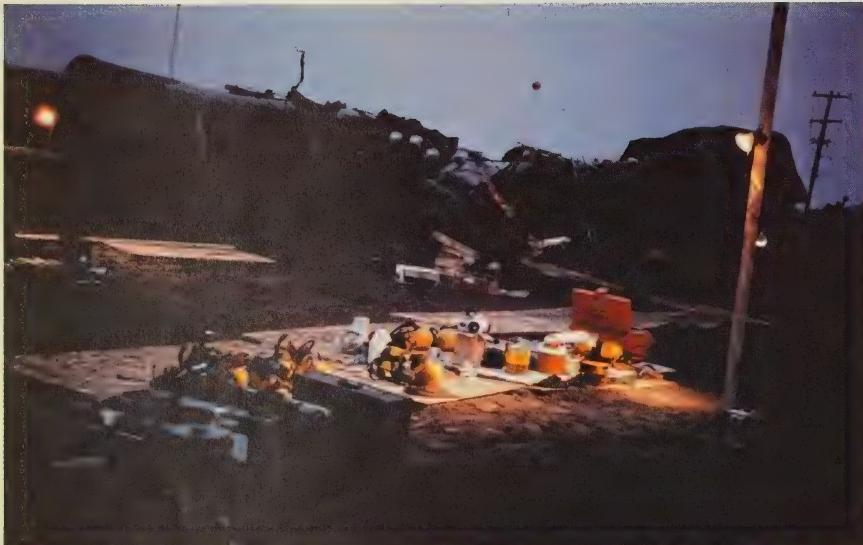
Meanwhile in downtown Toronto, air mass modellers following the direction of the air mass were placed to help predict the probable chlorine concentrations at various distances downwind under several scenarios of chlorine discharges at the site. These calculations, checked against those of a Dow Chemical Co. computer and with health criteria, determined the area to be evacuated in the event of a large release of chlorine. The Dow Chemical computer in Midland, Mich., nicknamed Daisy Mae by company workers, predicted where the chlorine would travel on the basis of weather conditions.

Another team sampling air quality was formed from staff of the Ministry of the Environment and Ministry of Labour at a regional water plant. The team answered public concerns about health effects involving possible high air contamination levels in private homes, commercial buildings, schools and valley areas. Fifty-nine inspections were performed using "Gastec" or "Draeger" tube sampling techniques to check for chlorine, styrene and/or toluene levels. While contaminant odors were reported, more detailed test results confirmed safe conditions in repopulated areas.

As well, the environment ministry established a 24-hour information telephone line at its Central



Right: Map shows chlorine plume direction between 5:30 and 6:30 on November 14.



Weather balloons and air bottles were important equipment at the site.

Region office in Toronto to answer calls from residents, worried about environment problems after returning home.

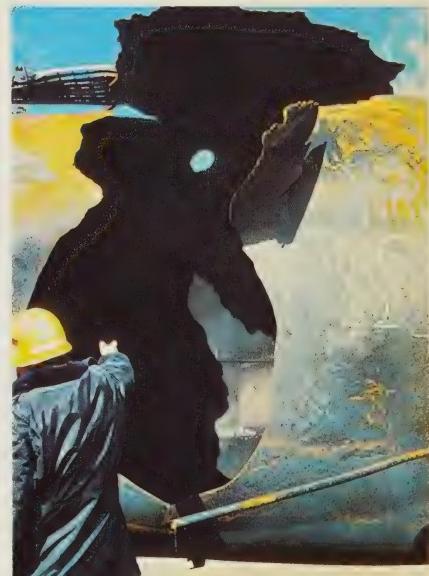
After the derailment and initial explosions, the greatest danger was the possibility of a complete failure to seal the leaking tanker and of increased chlorine releases. The hazard was reduced by permitting fires in ruptured hydrocarbon tanks to burn out while keeping other cars in the pileup cool to prevent further ruptures. With the fire still burning on Monday, the team from the chlorine emergency plan (CHLOREP) inspected the chlorine tanker, finding a metre-long hole and damage to the tanker top, which would make

patching difficult and complicate the safe removal of chlorine liquid and vapor from the tanker. An inspection using a dipstick inside the tanker revealed that about 10 tons of liquid chlorine was covered by between nine inches and 12 inches of ice. (For further explanations of problems of handling the ice blanket and removal of the chlorine, see The Meetings.)

Once the fires died out, the CHLOREP team plan was to patch the rupture and pump out the chlorine under pressure. If this procedure was accomplished, it would have been faster than a vacuum transfer. However, adequate patching proved difficult because of the position of the car and the damage to it, and an alternative plan was

devised between the environment ministry and the chemical workers. After assessing risk factors, vacuum transfer was chosen as the safest method. The TAGA units continually tested the air before remaining evacuees were permitted home. Air resources experts provided technical help on the chlorine vapor removal, which was completed on Sunday. At this time, environment ministry officials suggested that the tank should be opened for a visual inspection. Air tests were continued until the wreck was finally neutralized.

Meanwhile, aerial surveys on Monday had shown that water runoff from the site was flowing



Officer points out large rip in a burnt-out tanker.

through a small drainage course into a storm sewer system, which had an outlet near the mouth of Wolfedale Creek. Firefighting activities of spraying immense amounts of water at tanker cars had unavoidably created the runoff. From the air, the creek water appeared highly discolored but water color dissipated as it met the large flow of the Credit River. Ground survey crews also found that substantial number of fish had been killed in the creek. Brown-red in color, the creek was quite alkaline with a pH reading of 11.4.

Extensive water sampling of surface drainage was performed from the site and downstream in Wolfedale Creek and the Credit River. The well and treated water from Lakeview Water Filtration plant, which obtains its supply from Lake Ontario, were also tested. Environment ministry laboratories conducted standard chemical analyses and special tests using mass spectrometry and gas chromatography.

Although the testing showed that the public water supply was unaffected, results showed high levels of toluene and styrene near the mouth of the Wolfdale Creek and lower concentrations in downstream regions of the Credit River. By Thursday, alkaline amounts were reduced to a downstream pH reading of 10 and toluene and styrene levels were only 10 per cent of earlier readings.

As the hazard seemed to decrease, water, mud and soil samples were collected from the site for preliminary lab tests. After the chlorine danger was eliminated when the tanker was removed, a comprehensive soil sampling began to pin down the extent of the contamination. Aerial photographs taken during the firefighting were used as a guide to the approximate area of contamination.

On November 20, work began around the contaminated soil to contain seepage. An emergency downstream dam was also built in the drainage



Aerial photograph shows extensive contamination of surrounding soil.

courses as a backup system. By mid-December, a closed French drain well collection system was installed along the rail to isolate and collect contaminants leaching to the porous rail bed.

From November 20 to May 7, about 350,000 gallons of contaminated seepage were taken from the site and stored at a local sewage plant. Detailed sample analyses and treatability studies of stored waste water were performed. These studies showed that seepage could be treated at a sewage plant, and controlled discharge over a 30-day period started on April 29.

Contaminated soil was trucked to the Chinguacousy landfill site in the northern part of Peel Region until objections from local citizens halted this disposal on November 27. The soil removal program resumed on December 19 after special storage vaults were constructed at a landfill site in Mississauga. This continued until January 15. Throughout the cleanup, about 30,000 cubic yards of contaminated soil were removed.

After the crisis had ended the Ministries of Environment and Labour continued to monitor



Workers testing soil at the site.

air at the Chinguacousy landfill site, the derailment area and nearby industrial plants for possible occupational health problems. As well, the labour ministry conducted about 300 tests on firefighters, police and workers exposed to the dangerous gas. However, during the fire and packing operation, a mobile unit of the labour ministry's chest disease section was stationed in Mississauga to examine firefighters and police exposed to chlorine.

During the crisis, the environment ministry provided 108 staff from its Central Region, air resources branch, water resources branch, as well as from its contingency planning section of Pol-

lution Control, laboratory services and information branches. As well as integrating regional and headquarter staff, the ministry also worked closely with environmental health authorities from the ministries of labour and health. Duty watches were maintained in three shifts over 24 hours throughout the crisis.

Deputy Environment Minister Graham Scott, involved in the ministry's activities since the early hours of Sunday, took charge at the site on Tuesday. He presented environmental advice at the command post meetings and was assisted by appropriate technical staff at the ministry. As well, Dr. Max Fitch, director of special studies



Peel police officer undergoing tests.

and services branch of the labour ministry and medical adviser to the environment ministry, provided assistance during command post meetings and for environmental health recommendations. Dr. Fitch and several senior officials at the site were, with their families, among the 216,000 residents evacuated during the emergency.

But the continuous heavy responsibilities rested with the air monitoring teams. As Mississauga Mayor Hazel McCallion stated after the incident: "I never realized the importance of wind direction until the derailment. Every shift made a difference."

Summary Statement of Chlorine Concentration Levels found in the Mississauga Area During November 11-18, 1979

During the period November 11-18, 1979, the Ontario Ministry of Environment carried out monitoring for chlorine in the area surrounding the derailment site of CP Rail train 54. The following is a summary of the data gathered and reported; all concentrations listed below refer to instantaneous peak ground level concentrations.

- a) The chlorine concentrations were observed to be highest near the derailment site, and decreased as distance from the site increased.
- b) The higher concentrations of chlorine were observed to lie in a "plume" which originated at the site and moved downwind, spreading out in a well-defined manner as the distance from the site increased. Outside of this "plume", normal background concentration levels of chlorine were detected. Typical background readings were 0.3 ug/m^3 (micrograms per cubic meter) or less. This corresponds to about 0.0001 ppm (parts per million by volume) of chlorine.
- c) On Sunday, November 11, the highest chlorine concentration level was 150 ug/m^3 , (0.05 ppm) and was detected at the Domtar Brickyards on Dundas East at Mavis at about 1840 hours.
- d) On Monday, November 12, over 400 ug/m^3 (0.14 ppm) of chlorine was detected at Forestwood Avenue and Wolfedale Road at about 2330 hours. In this concentration range, the TAGAs are non-linear in response but the Ministry's monitoring contractor, Sciex Limited, has informed us that the concentration was very probably below 1000 ug/m^3 (0.34 ppm). Had the concentrations remained high for more than the period 2330-0100 hrs (see point (e) below) the TAGAs would have been recalibrated to operate linearly in the higher concentration range.
- e) On Tuesday, November 13, 300 to over 400 ug/m^3 of chlorine ($0.10-0.14 \text{ ppm}$) was detected just south of the tracks along Mavis Street between 0000-0100 hours. Again the remarks of (d) for these high readings apply; with the upper limit not likely over 1000 ug/m^3 .
- f) On Wednesday, November 14, a maximum chlorine concentration of 200 ug/m^3 (0.07 ppm) was detected at Mavis and Dundas over several hours in the morning.
- g) On Thursday, November 14, a maximum chlorine concentration of 90 ug/m^3 was detected at Dundas and Mavis about 0500 hours.
- h) On Friday, November 16, a maximum chlorine concentration of 17 ug/m^3 (0.06 ppm) was detected at Dundas and Mavis about 0500 hours. Complete re-entry of all citizens occurred later on this date between 1500 and 2300 hours.
- i) For the last 12 hours of November 16, and during November 17 and 18, only background concentration levels of chlorine were monitored.

Chlorine Exposure Guidelines

These guidelines were announced by the Ministry of the Environment based on information supplied by the Ministry of Labour.

Normal background level:

less than 0.001 ppm or 3 micrograms

Discomfort level:

less than 0.01 ppm or 30 micrograms

Acceptable workplace exposure (8 hours):

1.0 ppm or $3,000 \text{ micrograms}$

Health threat threshold level (15 minutes):

3.0 ppm or $9,000 \text{ micrograms}$

Acute danger to life:

900 ppm

Health

The youngest was a newly-born baby and the oldest a 100-year-old man. And they all survived a series of dramatic evacuations from three hospitals, three nursing homes, two extended care centres and one home for the aged. Huddled in blankets, strapped to stretchers or dressed in street clothes, 1,449 patients were moved to 31 hospitals in a 14½-hour span. If the Mississauga derailment and evacuation is described as a miracle, this is one of the reasons why.

Dr. Martin Dobkin, night physician in charge of the emergency department of the Mississauga General Hospital, and a former mayor of the city, was startled when he saw an orange and yellow blast outside a hospital window. "The sky lit up, just like an atomic bomb."

While Dr. Dobkin watched the atomic bomb-like scene, ambulances in the area responded quickly. Immediately, four ambulance crews reported a bright glow in the sky near Lake Ontario. As well, the Royal Canadian Mounted Police (RCMP) at Toronto International Airport alerted the Metropolitan Toronto Department of Ambulance Services that a huge explosion had erupted in the area of Dundas Street and Hurontario Street. Four minutes later at 11:59 a.m., three ambulances from the Halton-Mississauga Ambulance Service were dispatched to join an ambulance already at the scene. Ambulance crews racing to the fire imagined mass destruction would be awaiting them. To their relief, there was little damage and no injuries. Ambulances were strategically situated at the site in case of serious injuries to firefighters, exposed to explosions, chemical fumes and a raging fire.

On the basis of information received from the site, Halton-Mississauga Ambulance Service put into action its emergency support unit, a vehicle loaded with extra first-aid materials, communications equipment and other apparatus needed during a major emergency. As well, the services' senior staff was notified. At the same time, the

Metro Toronto Department of Ambulance Service was asked to send their emergency bus and extra support units. The Halton-Mississauga service also alerted Queensway General Hospital and Etobicoke General Hospital in the nearby Metro Toronto borough of Etobicoke about the explosion and fire. By this time, off-duty Halton-Mississauga and Metro Toronto ambulance employees were called in case more ambulances were needed.

An off-duty communications worker with the Metro Toronto Ambulance Service saw the exploding fireballs while driving home along the Queen Elizabeth Way near Hamilton, about 50 kilometres away from the fire. Although on vacation for another week, he immediately reported for work at the derailment. First spending hours clearing spectators out of the immediate area, he also assisted the first evacuees to buses going to reception centres. Later he helped transfer patients to other hospitals.

Since the potential danger of fires and explosions was a prime threat, Peel Regional Police and the combined ambulance services of Metro Toronto, Halton-Mississauga and the province decided to establish command posts just south of the fire. It was felt the danger would not be passing and permanent presence at the site was required.

At 2 a.m., the first casualty was treated. While covering the fire, a member of the CITY-TV crew, a Toronto television station, broke his ankle in a ditch about 20 metres south of the site. He was treated and taken to Mississauga General Hospital.

Within two hours of the first explosion, more off-duty ambulance staff were called, and the St. John Ambulance Brigade, a welcome and willing addition at any crisis, had arrived at the fire with vehicles and volunteers.

Following the decision to evacuate all homes

within 1,000 metres of the crash, ambulance and police vehicles drove through the area, using loud speakers to urge residents to leave their homes. Other ambulances evacuated invalids to Mississauga General Hospital from their homes.

As chemical fumes grew stronger, those closest to the fire requested and received breathing apparatus. Meanwhile, Etobicoke, Queensway, York-Finch and Mississauga Hospitals—all within easy access of the fire—were advised of the chemical mixture burning in the fire.

Just before 4 a.m., the wind shifted and the command centre and adjacent mobile units moved 500 metres north of the site to the Bell Canada building. An ambulance team was sent to Square One shopping mall, where the Red Cross had established the first evacuation centre, and to Erindale Secondary School, another reception centre.

By 6:30 a.m., fumes from the chlorine tanker were blowing southeasterly in the path of the Mississauga Hospital, Extendicare, a nearby extended care unit, and Chelsey Park Nursing Home near the hospital. Officials at the command post began considering evacuating the hospital because of fears that chlorine gas might enter the hospital through its air conditioning system. Seven hospitals in a 40-kilometre area were asked if they had available beds for 500 patients, who might be moved from the Mississauga Hospital. Ambulances from eight areas were also called to help while ambulance staff also continued to check hospitals and nursing homes for available beds.

By 8:45 a.m., Peel Regional Police Chief Douglas Burrows had decided that evacuations of the hospital and nursing home were necessary. The hospital discharged 250 of its 450 patients who were able to leave. Relatives of patients were ushered into the hospital auditorium to hear names of patients released.



Ambulance workers gather to move patients.

In the move, critical patients received the first transfers. Heart patients ready for surgery, lung patients and a woman, who had given birth just two hours before, were taken by ambulance to hospitals in Metro Toronto, Burlington and Oakville.

The evacuation proceeded with calm efficiency. Members of the hospital's auxiliary worked side by side with staff in the emergency department, helping to get patients prepared for ambulance personnel. From the hospital, ambulances transferred 186 stretcher and wheelchair patients including many with intravenous units. Less seriously-ill patients were taken to other hospitals by bus. A special care team from the Hospital for Sick Children in downtown Toronto arrived to look after a particularly-ill premature baby and

brought incubators for other babies. A mother with newly-born twins was wheeled out with a baby on each arm.

There was no panic. Hospital staff and auxiliary volunteers bundled patients in blankets. As they worked, many knew that their own families were also being moved and that they wouldn't find them until after the hospital was closed.

Twelve hospitals and nursing homes had prepared to admit the evacuated patients. Charts, medical records and necessary machinery were attached to patients' beds. For those connected to intravenous units, charts were attached between the stretcher straps and their stomachs.

Staffs at hospitals receiving patients handled the situation equally well. One hospital clerk at a

Toronto hospital diverted a frantic husband looking for his wife, sending him to fill in admitting forms to take his mind off his seemingly missing wife. The couple was soon reunited. One ambulance driver entered St. Joseph's Hospital in Toronto, which took 20 of the Mississauga patients, carrying a baby in each arm. St. Joseph's got an early jump on the influx, postponing admissions for patients scheduled for elective surgery. But no one was released before schedule. And the hospital switchboard was flooded with calls from relatives and friends trying to find where patient had been taken.

Hospitals cleared the maximum number of beds in anticipation of the transferred patients. Queensway Hospital had discharged about 50 patients on Sunday morning. Sixteen patients, mainly elderly, extended care residents, arrived at the hospital.

At York-Finch General Hospital in northwestern Toronto, dozens of wheelchairs and stretchers were lined up in the emergency department, prepared to receive 50 or more patients. The hospital was later advised that the Mississauga patients had been successfully placed elsewhere.

Critically-ill patients were transferred without setbacks. Hospital officials were concerned about moving patients, especially ones with respiratory problems, because chlorine fumes outside the hospital might be harmful. But the decision had been made that the greater danger was posed by the gas spreading into the hospital rather than moving critically-ill patients.

For many evacuated extended care and nursing home residents, the move was just as beneficial as a rest. In the bargain, they received a change in cooks, a new environment and a few days' vacation from their diets.

Nevertheless, one Mississauga extended care resident, taken to the E.C. Drury School in Milton, northwest of Mississauga, along with about 200 others, never completely relaxed.

Evacuation of Hospitals and Nursing Homes

November 11 and 12, 1979

Anxious to go back to his room in Mississauga, he believed each day would mean returning to his familiar surroundings. Donning his hat and coat each morning, the patient was ready to leave at a moment's notice. Not until a week later was he able to realize this expectation.

With the safe evacuation of patients from the hospital, extended care residence and nursing home completed in about four hours, the hospital was closed except for five security guards and one switchboard operator. All six staff had been supplied with gas masks. Following the evacuation, other staff members completed the paperwork regarding the destination of each patient and then telephoned next-of-kin about the patient.

Meanwhile, Peel Regional Health Unit began a 24-hour service which provided information to evacuees until the end of the danger. The unit gave direct help in evacuation centres and several nursing homes. Health officials joined other experts advising those making decisions. And the ministry's helicopter ambulance and crew were placed on standby for specific emergency at the crash site or for areas where ambulance services were depleted because their ambulances and staff were lent to the derailment and evacuation.

Since a large part of Mississauga was without health care facilities, many physicians and nurses volunteered their services. Four round-the-clock emergency medical centres were opened outside the danger zone. Some pharmacies remained open 24 hours a day for prescriptions and a dentist volunteered his services for emergencies.

In mid-afternoon, a new danger developed. Officials at the command post became alarmed when the winds shifted in a southeasterly direction toward Queensway Hospital, about eight kilometres from the fire. The hospital's administration was advised of the potential danger. In preparation for a possible transfer, 88 ambulatory patients able to go home were discharged while

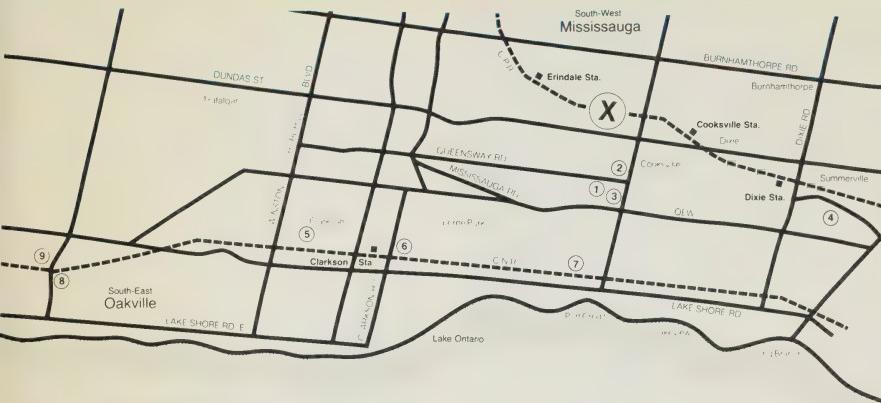
Name of Facility Evacuated	Patients Residents	Number Evacuated	Date	Time	Receiving Facilities	Total Evacuation Time	Date of Return
1. The Mississauga Hospital	450	188	Nov. 11	9:25 am	11		Nov. 18
2. Mississauga Extendicare	202	193	Nov. 11	9:25 am	2	3 Hours 15 Min's	Nov. 17
3. Chelsey Park Nursing Home	237	192	Nov. 11	9:25 am	4		Nov. 17
4. Queensway General Hospital	280	192	Nov. 11	3:45 pm	13	4 Hours 15 Min's	Nov. 13
5. Sheridan Villa Home for the Aged	246	234	Nov. 11	8:30 pm	1		Nov. 13
6. Pines Nursing Home	22	22	Nov. 11	8:30 pm	1	2 Hours 30 Min's	Nov. 13
7. Taara Nursing Home	53	53	Nov. 11	8:30 pm	1		Nov. 15
8. Oakville-Trafalgar Memorial Hospital	293	204	Nov. 12	12:30 am	6		Nov. 14
9. Oakville Extendicare	171	171	Nov. 12	12:30 am	2	4 Hours 30 Min's	Nov. 14

about 200 other patients were prepared for a move. Similar to procedures several hours earlier, ambulance services checked hospitals out of the danger zone for available room. A fleet of 65 ambulances waited in case the order for evacuation was given.

The decision was made at a meeting near the crash site. It was attended by John Dean, commissioner of Metro Toronto Department of Ambulance Services, hospital officials and Solicitor General Roy McMurtry. Hospital officials were worried about moving the seriously-ill patients but were told that another explosion might happen at any time. Police officials estimated that if there was a sud-

den explosion, the hospital would only have between 15 and 20 minutes to get people out before fumes would reach them.

Again, ambulance crews went into action, moving almost 200 patients to other hospitals in the Metro Toronto area. The first patients, three expectant mothers, were wheeled from labor rooms and left the hospital at 4:05 p.m. However, a woman, who was giving birth during the evacuation was kept in the hospital until her condition stabilized about two hours later. As many as 10 of the 70 ambulances in use lined up at the hospital's emergency door at any one time to carry patients to other hospitals. Again every patient was moved with medical charts and record on the stretchers.



Evacuated Health Care Facilities

- X Crash Site
- 1 Mississauga Hospital
- 2 Mississauga Extendicare
- 3 Chelsey Park Nursing Home
- 4 Queensway General Hospital
- 5 Sheridan Villa Home for the Aged
- 6 Pines Nursing Home
- 7 Taara Nursing Home
- 8 Oakville-Trafalgar Memorial Hospital
- 9 Oakville-Extendicare

The receiving hospitals, some for the second time, prepared for emergency admitting. Special arrangements were made for a comfortable transfer for intensive care and seriously-ill patients. In this evacuation, 16 of the Mississauga patients taken to Queensway earlier in the day, were moved again. At Northwestern General Hospital, a dietary worker spent 11 hours preparing meals and special diets in the hospital's kitchen for the 34 evacuated patients. After more than four hours, the Queensway patients were safely placed in temporary beds.

During the completion of the Queensway operation, experts and officials at the command post discussed a third evacuation, involving more

than 300 elderly residents in two nursing homes and a home for the aged. The three facilities were southwest of the fire but were in the possible path of the fumes. As in other evacuations, staffs prepared residents before the order was given. Ambulance supervisors went to each of the three facilities to co-ordinate with staff from the health ministry's nursing home inspection branch.

At 8:30 p.m., after meeting with other officials, Solicitor General McMurtry ordered the evacuation of the Taara Nursing Home, Pines Nursing Home and Sheridan Villa Home for the Aged. Nursing home inspection staff arranged for 200 air mattresses to be delivered to several temporary

shelters from the Canadian Armed Forces Base, Downsview, in northwestern Toronto.

The more than 300 residents were moved in the quickest evacuation of two and a half hours. Residents of Sheridan Villa were assisted in their move by volunteers from the community, including Boy Scouts, Rovers and the Lions Club. Staff from Peel Region Social Services Department and volunteers from the Red Cross, Salvation Army and St. John Ambulance also helped in the move to Peel Manor in Brampton. Sheridan Villa nurses accompanied residents and stayed with them throughout the two-day evacuation. Accommodation for Sheridan staff was provided in Brampton. One generous company provided several camper homes behind the manor for the nurses' use. Brampton residents also sent food and fresh clothing for the staff and residents.

Most of the 46 persons who stayed at Castleview Wychwood Towers in Toronto were settled in emergency beds in the auditorium and considered the trip an unexpected adventure.

Meanwhile, the wind shifted, creating the possibility that chlorine fumes would blow toward Oakville-Trafalgar Memorial Hospital and a nearby Oakville extended care facility although both were outside the evacuated zone. After ambulances finished transporting nursing home residents, they proceeded to the Oakville Hospital to await further instructions. Inside the hospital, 89 patients were sent home while staff prepared for the possible move. In its now machine-like efficiency, ambulance services checked the availability of beds in Hamilton and Burlington for more than 200 patients, including 46 patients from the Mississauga hospital.

The fourth and final evacuation began at 12:30 a.m. on Monday morning. As during the previous hospital evacuations doctors came to stay with their patients waiting to go to ambulances or buses and gave special attention to the gravely ill.



Left: Patient with intravenous unit is strapped to a stretcher before being transferred to another hospital.

Below: Equipment for a patient's treatment as well as medical charts and records were also taken in the transfer.



Three critically-ill patients each were accompanied by a doctor and nurse. As at the other evacuated hospitals, all elective surgery patients were sent home. Hospital auxiliary members and many volunteers assisted doctors, hospital staff and ambulance attendants in the move. One ambulance had to wait for the release from the recovery room of one patient, who had been in surgery when the evacuation order was given.

Surplus active treatment beds were reopened for this emergency on the authority of Health Minister Dennis Timbrell to accommodate arriving patients. Oakville-Trafalgar psychiatric patients were accompanied by their nurses, who stayed with them in the Hamilton facilities until their return. At Hamilton Psychiatric Hospital, nursing home inspection staff made beds for 132

Oakville extended care residents and helped them resettle.

Meanwhile at the disaster site, crews fighting fires, sealing the chlorine tanker and directing overall operations, continued to face the risk of medical injuries. The Ontario Medical Association, which had offered assistance to the minister of health in the early hours of the emergency, was asked by ministry staff to provide medical coverage and an advanced life support capability. An association medical team set up two rooms in the command post building. One was for medical treatment and the other for cleansing anyone sustaining extensive contact with chemicals on the site. The association during four days, 24 hours a day provided four emergency physicians equipped to treat cardiac emer-

gencies, chemical burns or other injuries, which might occur at the site. These doctors also watched for physical and mental signs of over-work and tension among the many people working at the command post. They watched over diet, decreased cigarette smoking and increased use of fruit juices and fruit.

After the initial crisis on Sunday had been addressed, a formal advisory group was formed to aid the solicitor general. Health ministry officials participated in this group.

During each day of the evacuation, staff from the ministry's nursing home inspection branch toured many facilities housing evacuated nursing home residents to ensure their well-being and comfort. In Streetsville, ministry staff were

assisted in helping resettle residents by students from Streetsville Secondary School. Since the high school was converted to an evacuation centre and classes had been cancelled, many students went to the Chelsey Park home in Streetsville three times a day to help make beds, feed the elderly and perform other duties.

As well, teams of nurses and inspectors from Peel Region Health Unit assisted in some evacuation centres until the centres were closed. Inspectors were concerned with food, hygiene and sanitation while nurses helped evacuees with health problems, particularly young mothers with children and older people, who had left their medications at home. Other public health inspectors were on standby to assist their Peel colleagues and Ministry of Environment officials. The Peel nurses also were sent to nursing homes in Brampton and Mississauga, which had received evacuated elderly residents and needed additional staff to cope with the increased numbers.

At evacuation centres run by the Red Cross, St. John Ambulance manned the first-aid posts and took care of transportation of handicapped people. In addition, the Salvation Army had set up three shifts a day of 50 volunteers to aid at



Ambulances line up to take patients.

several evacuation centres, especially with the elderly or handicapped.

Just before noon on Tuesday, ambulances and buses began returning patients to Queensway Hospital. In mid-afternoon as the evacuation areas were shrinking, Sheridan Villa and Oakville extended care patients were transported to their homes. About 20 Peel public health nurses assisted in moving Sheridan patients and stayed to help with feeding and settling the residents.



Ambulance communications worker checks for available hospital beds.

In late morning on Wednesday, the return to normalcy began for the Oakville-Trafalgar Hospital. About eight hours later, it was completed. Meanwhile, the Peel Region Health Unit received

inquiries about residual effects of chlorine and food left out in their homes during the evacuation.

And on Thursday, ambulance services coordinated the return of 53 residents to Taara Nursing Home. As well, in response to numerous questions, Peel Health Unit issued statements to the news media, advising the public that there was no need to be concerned about food exposed to chlorine in abandoned homes. The usual precautions involving perishable foods should be observed.

On Friday—the final day of evacuation—the rest of the evacuated residents returned home by before midnight. The first three medical facilities evacuated remained in temporary quarters. On

Saturday, Chelsey Park and Mississauga extended care patients were returned while plans were laid for the reopening of Mississauga Hospital.

Almost to the hour, patients began being readmitted through the same Mississauga Hospital doors that they had been rushed through a week before. By 5 p.m., the first hospital to be evacuated was the last occupied. The ambulance services were officially advised to "stand down", and all but one ambulance and communications vehicle left the site.

A day later, health officials, including ambulance staff, dedicated themselves to another onerous chore—the task of writing reports and completing paperwork accounting for the previous week's activities.

The dramatic evacuation of patients involved more than 650 people from 25 ambulance services. The call for help had been answered by 133 ambulances, 15 municipal buses, five emergency support units, two communications vans, two trucks and one ambulance bus. Ambulance personnel costs, exclusive of regular salaries, have been cal-

culated to be more than \$130,000 with vehicle costs an additional \$17,000. These costs do not include volunteer organizations. But the dedication of the people preparing patients, pushing stretchers and wheelchairs and driving ambulances made the costs seem unimportant. As J.W. Lidstone, assistant commissioner of the Ontario Provincial Police, observed:

It is clearly evident that the ambulance services, their efficient communications network, and the dedication of their personnel, made the evacuation both possible and successful.

Health Minister Dennis Timbrell concluded in his statement to the House on his ministry's participation in the Mississauga area hospital evacuation:

In every way it was a magnificent performance characteristic of the dedicated staff who provide us with the finest health care system in the world. I know all members of this House representing the people of Ontario are grateful to them.



Hospital staff prepare records to be sent with patients going to other hospitals.

Mississauga

It was Saturday night and Anne Williamson's first night as dispatcher at the city's work yards. She remembered the advice when assigned the job. "The night shift is boring, and for a newcomer there is not much to do but get accustomed to the place." Heeding this advice, she brought her mother's dog for company. By 11:50 p.m., she had just finished taking the dog for a walk around the building, located several hundred metres south of the CP Rail tracks on Mavis Road. Then, suddenly an explosion occurred and pieces of metal travelled through the air, hitting the building. She acted

quickly and left the building. So much for a quiet night.

Not far away, another works department employee at home saw the fire and went to the yard, where he drove out a department vehicle. He started radioing "Mayday"—the universal distress signal. Dave Debenham, the works department manager, saw the glow from his Streetsville home and jumped in his works department car, where he received the signal. Arriving at the scene about 12:30 a.m., he identified himself to police. Debenham returned home and alerted various

civic officials of the fire. Later that morning, he went to the site and assisted throughout the week by filling requests for equipment and materials.

Under Debenham's direction, city work crews set up road barricades for police and borrowed 112 others from nearby municipalities. But despite the derailment, the city must be serviced. Cognizant of the time of year, Debenham wanted to make sure the city would have enough equipment in case of an early snowfall. Consequently, he ordered all works trucks and equipment be moved to the Malton yard in the city's northeastern corner from its Streetsville and Clarkson yards. The Clarkson yard was in an evacuated zone.

Similar to other city departments, the works department continued its normal tasks in the rest of the city, in addition to picking up garbage at the evacuation centres.

On the site, Debenham kept in close contact with command post officials in order to fill requests by specialist chemical crews, police or firefighters. Thus, the works department delivered loads of sand and gravel to cover spilled chemicals and wood planks for a walkway on the muddy terrain near the derailment. After the extensive water spraying by firefighters, the two-acre site looked like a battlefield in the First World War.

In the pursuit of supplies, the works department raided its central stores for equipment, clothing and materials, such as batteries, gauntlet gloves, nails, safety hat liners, grab hooks and even soap. Debenham also accompanied a police officer to a shopping centre where they purchased several pairs of socks for chemical crew workers, who wanted a fresh change of socks after walking in the muddy and wet ground near the tankers.

During the crisis, all city departments, except the fire department, performed secondary and supportive functions. These departments may not have been involved in the front-line operations of capping the tanker or deciding evacuation zones but their tasks eased the pressure and worries for



Right side of the photograph shows the proximity of the railway tracks to municipal buildings.

ordinary citizens and decision-makers.

Mississauga Transit is a prime example. While most of the 216,000 persons who evacuated the city used their family vehicle, many of the city's fleet of 126 buses picked up careless evacuees, particularly those in high density apartment areas, and dropped them off at evacuation centres.

Transit officials readily admit that its service suffered an initial setback during the explosion when its transmission tower 30 metres from the derailment site was knocked out. For a suburban transit system dependent on radio communication, the sudden loss increased confusion during the first few hours. Police had sealed off the immediate area around the disaster site, keeping transit and other workers from getting to the garage to volunteer their services. A short time later, roadblocks were relaxed when it was understood that Mississauga Transit buses would be needed in the evacuation.

Fortunately every transit employee carries an identification card, which includes the worker's photograph. However, many city workers with little or no special identification found police would not let them pass although they had been called to work. Some Mississauga officials now have vowed that a new identification card system will be instituted so that confusion and frustration at police roadblocks would be decreased in a future emergency. But police, acting on orders, were strict about who was permitted to enter into the evacuation zone, and the transit identification cards were passports through the lines.

When Transit Superintendent Arnold Covell learned of the accident about 12:30 a.m., he ordered all available buses to three locations close to the derailment. Police then directed evacuees to these collection points, where they would be taken to evacuation centres. This centralized collection point technique was used over and over throughout the following day as the evacuation zones expanded.

However, confusion sapped some efficiency of the available buses on that first night. Edward Dowling, the transit's general manager, said in a speech that often a bus and its driver would sit in a plaza parking lot as requested by police but no one would come. Part of that confusion was to be expected in those frantic early hours. However, much of it arose from the lack of any prepared emergency liaison between the police and transit officials. Dowling further explained that "in the end, it was our transit system's willingness to play a major role that led to its being used as well as it was and in establishing the missing emergency communication line."

Throughout the first night, drivers and garage staff called into transit headquarters to offer their services and virtually all of those on duty Saturday night stayed to wait for a route. Transit workers could not be ordered to work in the evacuation area but almost 100 per cent of the staff, half of them living in the evacuation zone, never gave it a second thought.

By 5:30 a.m., the transit authority had 27 buses ready to go from an improvised marshalling yard outside the evacuation area. By 9 a.m., it increased to 50 buses. Drivers and mechanics coming to work were redirected there. Senior staff at headquarters manned the telephones to maintain the newly-established contact with police. Buses were sent to help evacuated patients from Mississauga Hospital and six senior citizen and nursing homes. Patients, capable of walking or in wheelchairs, were placed in buses and taken to hospitals in Burlington, Hamilton, Brampton and Milton. Wheelchairs were tied down in aisles with straps borrowed from ambulances. Drivers helped to carry many senior citizens on and off the buses.

Often buses were involved in taking a group to one reception centre only to discover a few hours later that the centre was being closed and the group must be moved elsewhere. As well, buses were caught in bumper-to-bumper traffic as motorists

attempted to leave their homes. However, transit drivers obtained permission from police and cut through evacuated areas on roads banned to all but emergency traffic.

Late Sunday, buses were sent to Sherway Gardens, a covered shopping mall in neighboring Etobicoke, for the transit's largest single assignment. Within 10 minutes of the police request, 18 buses arrived in convoy to carry an estimated 600 persons to their final destination, the International Centre. Dowling described that transfer as the transit's proudest moment. "More importantly it illustrated how masses of people can be moved on relatively short notice when good co-operation and liaison exists between police and transit."

During the rest of the week, all routes outside the evacuation zone were back in operation. On Monday and Tuesday, special express buses were dispatched to the Islington and Yorkdale subway stations in Metropolitan Toronto from Meadowvale, a suburb north of the evacuated zone, and Streetsville for those commuters who used transit to get to Toronto. Meanwhile on Wednesday, buses were used again to move about 1,000 persons to hotel rooms in Metro Toronto and Oshawa from evacuation centres. Twenty-four buses were sent to Streetsville Secondary School and the International Centre to carry the evacuees to the hotels. On Friday and Saturday, the same people were returned to their homes or back to the evacuation centre where they had left their cars.

In all likelihood, the first evacuees from Mississauga were not people but animals. The city's animal shelter is located just north of the site on Mavis Road. Early Sunday, police ordered the 70 animals removed since the area was to be sealed off with the strictest security. Len Addison, supervisor of animal control, arranged that the animals, mostly dogs and cats, would spend the duration of the evacuation at the Toronto Humane Society shelter in downtown Toronto. Later he



The foreground shows the charred remains of municipal equipment while the background indicates the closeness of suburban development.

helped to take pets of a neighboring hospital out of danger.

But Addison discovered he had other animal-related tasks later that week. In response to many evacuated residents, worried about their pets left at home, the city and the Ontario Humane Society organized a feeding program for these pets. Through the news media, pet owners were advised of the program and were asked to leave keys to their houses or apartments at an Ontario Humane Society office. A number of keys were also delivered to city hall. When leaving the keys, owners were asked to sign a release, allowing their house or apartment to be entered by a society representative and a police officer. A total of 1,841 keys were left for the program which started on Tuesday with the help of humane society branches in Ontario. Most of the pets were cats, dogs or birds, but a few were more exotic including a boa constrictor. An ant colony at the University of Toronto's western campus at Erindale College was fed by the student, who had built the colony. Taken to the college and left for a few hours, he looked after his tiny charges.

Moreover, the offer of hotel rooms did not include pets and the resulting problem was passed to animal control staff. A veterinarian was sent to reassure evacuees that their pets would be safe. Some pets were taken to a boarding kennel in Oakville while others were placed with the Etobicoke shelter. Pets were returned to their owners on the weekend.

Perhaps the nerve centre of the city's participation in the week-long crisis centred around its 24-hour emergency telephone service. It provided citizens with up-to-date information on evacuation boundaries, reception centres, medical services, recent statements from the command post and available city services.

Jocelyn Garrett, of the city's information and public relations department, was the first to start

the emergency telephone service. Although as supervisor she knew how to operate the switchboard, until Sunday at 12:30 p.m. she did not normally put that knowledge into practice. "The calls were coming in so fast, you just learned so quickly," she said. "The most frantic calls on Sunday were from people inquiring about accommodation in private homes." By the second day, people were worried about the pets they left at home.

Mrs. Garrett, a few members of the survey crew and a regular operator, manned the service during the first evening. As the information increased and the crisis loomed larger, the system was streamlined. At peak hours up to 12 telephones were being answered by municipal employees who were prepared to work during the emergency. These included staff from information and public relations and the works department as well as councillors. The latest information was placed before each person answering a telephone. Some calls were directed to experts, such as Len Addison, who got most of the animal-related calls.

When a new development was released at the command post, Jim Kaakee, the city's director of information and public relations, would simultaneously telephone the statement to city hall. Immediately, the new information would be circulated to those manning the telephones. The switchboard also collected the names of persons offering and requiring private accommodation. These names were matched with efficiency comparable with that of the Red Cross, which was also taking offers of accommodation at the evacuation centres.

When city hall opened on Wednesday, callers inquiring about normal city business were asked to leave their numbers, and the staff in that department would return their call in about 10 minutes. Meanwhile, all such city hall calls were collected and delivered by runners to each department. This kept emergency lines clear for derailment calls and

prevented overloading the city hall manual-cord switchboard. For maximum efficiency, each caller was limited to thirty seconds, although many overseas inquiries about relatives were given longer explanations.

Mayor Hazel McCallion believes this is an invaluable service during any emergency. "People have to have some local place where they can ask questions and get answers."

Throughout the emergency, two municipal services operated with reduced staff and on a limited scale. Hydro Mississauga and the city's parks and recreation department suffered heavy damage losses to their buildings on the southern side of Mavis Road. Hydro Mississauga's new office building in skeleton construction stage was set back two months in its completion after metal pieces of tankers bent steel poles and were lodged in concrete floors. As well, the utility lost a main sub-transmission feeder on Mavis Road, causing the area to be without electricity.

At 11:58 p.m. on the Saturday night, the log of Hydro Mississauga shows that 27.6 kv feeder breaker supplying power to Mavis Road and the surrounding area tripped and locked out. The supervisor on call was summoned but no trucks were accessible because Mavis Road was now blocked by police. However, Ontario Hydro responded to the problem and a crew restored power at 3:51 a.m. on Sunday.

Later that day, the utility's general foreman and two linemen were escorted by fire department officials into the service centre garage and took one of the line trucks. At that time, they viewed the considerable damage to doors, windows and the roof. Miraculously no damage was done to a fleet of 70 vehicles, and \$1.5-million worth of distribution equipment.

Throughout the week, control room staff—a supervisor and two operators—were allowed to work shifts in a restricted area in the building. They



Left: The greenhouses of Mississauga's department of parks and recreation were destroyed as a result of the derailment.



Flying pieces of metal landed in the skelton [sic] structure of a new building of Hydro Mississauga. The metal (shown in the far right corner) wedged itself into what is now the building's boardroom.



Mayor Hazel McCallion representing the city at the command post confers with Harry Parrott, Ontario Environment Minister, at the command post.

were supplied with breathing apparatus. A few management officials also came but there was little to do since no power interruptions occurred during that week. Usually, there a few each week. Bert Fleming, the utility's general manager, likened the situation of lack of power failures to the flight from Dunkirk when Allied troops crossed an unusually calm English Channel in 1940.

For the parks department, its operations for months later would be seriously affected by the loss of three greenhouses and a recreation building which housed the department's central operations, records, plans and slide screens. During the rest of the week, staff checked unused buildings in other areas, cancelled recreation programs and reassigned personnel to different buildings. Similar

to their neighbor across the street, the department's big job would come weeks and months later in trying to recoup from heavy damages caused by the explosion and fires.

For elected representatives, the week also had its frustrations and rewards. Many councillors, not part of the decision-making team at the command post, turned their efforts into answering calls at city hall, washing dishes at evacuation centres and reassuring constituents. Later after visiting the command post as a group on Monday, many councillors agreed that the mayor was the only person needed at the command post representing city interests. Similar to city hall staff, they may not have been the subject of headlines but they provided invaluable help and leadership.

The People

The deafening explosion and subsequent fire meant only one thing to Margaret Leslie, emergency services chairman of the Mississauga Red Cross Society branch. "I knew something major had happened and I would be getting a telephone call with instructions." Mrs. Leslie, who has worked as a volunteer for the Red Cross for 30 years, has her instincts well-honed. "I'm like a firehouse dog. When I hear a siren, I say 'What's that?'"

Her instincts were correct. Shortly after midnight Saturday night, police telephoned instructing her to go to the derailment site. "As soon as we heard the explosion and saw the fire, my husband and I changed our clothes and began to prepare." At the site, police directed her to open Square One, a large, covered, multi-storey shopping mall, as a reception centre for hastily-evacuated residents living near the derailment.

Quickly recognizing the magnitude of the emergency, Mrs. Leslie called the program manager and assistant manager of emergency services in the society's Ontario division. They, in turn, began to alert branches in adjacent areas to be ready for action. Back at Square One, registration desks were set, and more volunteers were awakened and asked to help.

As in many disasters and emergencies throughout the world, the Red Cross is recognized as the "disaster" authority. It might be earthquakes in South America, hurricanes in the Caribbean or floods in East Asia, the familiar red cross on a white background is at the scene. The Mississauga train derailment was no exception.

For Mrs. Leslie, the opening of Square One was the beginning of a long week of feeding, comforting and housing the refugees from the chlorine threat.

While Mrs. Leslie established the first centre, police were advising those living closest to the fire to leave the area. Some dressed quickly and obediently followed instructions. Others had taken the initiative and left before the police arrived.

In the first evacuations, there wasn't time to organize for frantic flights. Pillows, blankets and sheets were grabbed off beds and from linen closets. Parents dressed drowsy children while parties ended abruptly after the spectacular fireworks at midnight.

Throughout Sunday as the evacuation areas widened, residents were a little more prepared because they had been listening to news reports about the derailment. But in all areas, dirty dishes, uneaten meals, unmade beds and switched-on lights were left until the return. Most people locked their front doors. But some didn't, thinking that the police would have to get in the house. The scenario was reminiscent of the rabbit on his way to the Madhatters teaparty in Lewis Carroll's Alice in Wonderland. But for Mississaugans, they had the feeling that if they didn't move hastily, it may be too late.

For these people, life has been relatively orderly. Their city, the ninth largest in Canada, is a fast-growing, suburban community. Thirty years ago, most of the area had been farmland. Two major highways, the Queen Elizabeth Way and Highway 401, each run east-west through the city. Barring

traffic jams, a trip to downtown Toronto takes 30 minutes by car.

Attracted by less expensive housing in new suburbs, the mushrooming population caused the Ontario government to combine five small municipalities into the Region of Peel to improve services. Mississauga, which became the largest city in the Region, appears not to be a city in the traditional sense since it has no downtown core. It is largely a sprawling residential area with a sprinkling of light industry. Perhaps, the small town values of neighbourliness and trust lingered in the area, despite all the modern structures.

These people did not panic and many thought of their neighbors by offering rides to centres. Police were tipped off about neighbors who were elderly, infirmed or away for the weekend. But in a large city ghetto, attitudes may have been different.

A study conducted after the evacuation found that the evacuees were predominately professional, managerial and skilled workers with heads of households being between 40 and 60 years of age. The elderly and retired accounted for 10 per cent of the population while half of the homes had no children under the age of 18. Most (75 per cent) had no more than four persons in each house or apartment. And about 70 per cent of the families have a total income of more than \$20,000.

From the study, a sociological sketch can be drawn. These are people who would respect police and obey orders if given a reasonable explanation. They are essentially law-abiding and trust authority. During Sunday's evacuation, only a small minority (two per cent) refused to heed police advice and decided to remain at home during the week. The study also showed that 93 per cent of those interviewed thought the evacuation was justified.

Understandably, many were confused and bewildered but few questioned or argued with police about the evacuation notice. Later Sunday, police



A volunteer from the St. John Ambulance plays with a child at an evacuation centre.



A typical scene at an evacuation centre.

found evacuees more relaxed and curious about developments at the site.

For the first evacuees, most went directly to centres for some sleep before telephoning relatives and friends later in the day. When they arrived, registration desks were located close to the entrance. One member of each family was asked to register. Frustrated with the inconvenience of leaving home and the general uncertainty, some evacuees bypassed the registration. If volunteers were not forceful and explained the reason for getting names, many brushed past registration desks. Without names of evacuees, volunteer agencies could not answer inquiries about families from relatives and friends. A copy of the registration form was sent to the Red Cross headquarters in Toronto, where many inquiries were referred. (A society official noted that many

problems involving registering evacuees seemed to be eliminated in last summer's forest fire in Northern Ontario. Evacuees from several small communities were guided through one centre to register and then placed in temporary accommodation.)

After registering, evacuees were served fruit juices. Mrs. Leslie explained that "we found if you give people in distress something to eat or drink when they first come, they relax a bit."

Typically, evacuees did not stay in centres long. On Sunday, 19 evacuation centres were opened for receiving displaced residents. Some remained open for several hours until better accommodation could be found or centres were amalgamated. The centres were in 11 schools, two shopping centres, two lodges, a social club, a union hall, a trade centre and an arena. After the first day,

schools and the International Centre, the latter centre, remained the mainstay of the evacuation operations although some of the other halls housed evacuees. But after Sunday, about 85 per cent of the evacuees stayed with friends or relatives, six per cent went to hotels and seven per cent stayed in centres. The rest made alternative arrangements.

For those with no other place to go, they began to settle and make small spaces their own on concrete or gymnasium floors. Although conditions of "roughing it" were similar, centres lacked the excitement and aesthetics of camping.

Many had brought their pets—dogs, cats and birds—so the barking of dogs joined the chorus of chirping, purring and crying of babies and children. The smell of coffee and tobacco smoke lingered in every centre. The sight of wrinkled clothes and weary faces were as common among evacuees as volunteers.

On Sunday, just as the hectic pace for volunteers seemed tolerable, a wrench was thrown into the operation. As more information of the fire and chlorine threat became known, officials at the command post decided that Square One must be closed. Although not in the evacuated zone, it was too close to the northern boundaries if wind shifted and brought the deadly gas towards the mall, which at that time provided shelter for about 7,000 persons. Later for the same reasons, Silverway Gardens, another large covered shopping mall on the eastern outskirts of Mississauga, was also shut. From there, more than 2,000 persons, some of whom had come from Square One, were taken or directed to the International Centre near Toronto International Airport.

Meanwhile, Mrs. Leslie made her headquarters in Streetsville Secondary School, northwest of the derailment, when Square One was closed. The second largest centre, the school provided shelter for about 400 families while the International



A forlorn evacuee sits in a sleeping area at a reception centre.

Centre was the temporary home for more than 1,000 persons. Mrs. Leslie said the volunteers' job was made much easier by the generosity of those who offered food and accommodation to evacuees. Every centre set up a desk to compile offers and requests for accommodation in private homes. Evacuees, interested in that alternative arrangement, would check periodically until a suitable offer was received or would listen to announcements about accommodation. "Some people arrived at the centres, ready to take anyone who wanted to go," she said. Throughout the week, the society handled 950 offers of accommodation. Bert Fleming, manager of Hydro Mississauga, said his family was billeted with a family in Oakville. "It worked so well, we plan to do it again this year for one night."

For those who remained at centres, their basic needs were looked after. They were served three meals a day and health needs were met when first-aid posts were set up. Various kinds of entertainment were provided, such as films, sing songs and card games. But the inevitable boredom and frustration developed. "When people got aggressive,

we would ask them to help us with something and keep their minds off the long wait," Mrs. Leslie said. "We appealed to their better instincts."

As well, other potential problems were solved by common sense methods. Rumors were squelched quickly with an announcement of the latest up-to-date information from the command post. This direct communication with the command post was provided by the Ontario division of the Amateur Radio Relay League. By 7 p.m. Sunday, all evacuation centres were in radio contact with the society's headquarters and command post at the site. At peak, 17 sets and two mobiles centres were operating. As further help to communications, Bell Canada emergency crews installed telephones for the centres.

During the first two days, spirits and morale were high in the centres. A feeling of community had grown literally overnight. A smile would be a signal for a start of a conversation. Defences were down. Common problems were shared. Worries about children missing school, safety of abandoned houses and apartments and lost wages lined many faces. But stories were swapped about the fire and explosions.

After the first group was permitted to return home on Tuesday, those remaining felt abandoned, impatient and a bit resentful. But the degree of these feelings depended on the centre. Evacuees in centres located in schools seemed more content and relaxed about the situation than those placed in halls, which had few washrooms and restricted movements to one large stuffy room. Some husbands went to work each morning from the centres and returned at night to a wife, who had spent the day coping with children and hundreds of people. Other evacuees left the centres every day, using them only for sleeping.

Volunteers tried to make such halls as comfortable as possible but even they were affected. At the International Centre, bad feelings

between rival volunteer groups arose during a dispute about each group's responsibilities. Some members in each group tried to assume more responsibility than they were accorded. Personality clashes resulted. To soothe ruffled feathers, heads of each group spoke to their offending members. After that, the operation went relatively smoothly.

By Tuesday, Red Cross had closed three schools and combined operations in 11 other centres as more evacuees found other accommodation. After more than 144,000 returned home on Tuesday, the society's centres were reduced to five. And Wednesday's decision to move as many people as possible to hotels dropped the number of centres to two.

The move to hotels and motels relieved some tension. While not having all the comforts of home, hotels provided much-needed privacy and bathrooms en suite. Many enjoyed the luxury of breakfast in bed after their first bath and real sleep in days. One family shared the \$350-a-day Governor-General's suite in the Royal York Hotel, CP's flagship hotel.

But few of the hotels were equipped to look after the needs of people who were already in their fourth day away from home. Many had few clothes and little money. Some were also sick. Thus, teams from Red Cross were sent to hotels to meet the requirements of evacuees. As well, with only two centres operating, the amateur radio section ended its service.

As co-ordinator of the evacuation centres, Mrs. Leslie had numerous tasks. "I tried to visit all our centres." But after a few days, she lost her voice. "I just squeaked. When the mayor (Hazel McCallion, who had also lost her voice during the week) visited the centre, we squeaked at each other."

But for all the long hours and many years of service, Mrs. Leslie was not forgotten once the doors

were closed at the Streetsville and other centres. In April, she was honored by being named as Mississauga's Citizen of the Year for 1979—a year that saw many heroes in the train derailment crisis.



Margaret Leslie

Captain Robert Ratcliff, weary from a long day which started at 6 a.m. when he helped his church's band depart for a weekend concert, was relaxing in his living room with his wife and friends from Eastern Canada. Captain Ratcliff of the Mississauga temple of the Salvation Army had another busy day scheduled for Sunday. A Remembrance Day service was set for the temple at 11 a.m., and he was a participant in another service for veterans later in the day. But all best-laid plans went askew when the sky outside of his living room window lit up.

"My friend and I jumped into my car and drove toward the fire. The police wouldn't let us through so I identified myself to an officer at the blockade. He asked me to direct traffic while he assumed other duties. There were hundreds of spectators and the place was a madhouse with police cars going back and forth."

The impact of the first explosion had brought hundreds of curious onlookers from their homes. Captain Ratcliff had just begun to direct traffic when "the sky lit up again, like a fireworks display. Everyone in the area started to run. After that, the spectators disappeared."

About 3 a.m., he was relieved of his traffic duty and returned home to offer police the Salvation Army's mobile canteen. Police accepted the canteen and directed where the canteen should be set up. Later, the canteen was moved into a small shopping mall where coffee, tea, soft drinks and light snacks were served to police, firefighters and other officials on the line and at the command post. This service continued 24 hours a day until Saturday. The canteen was so much appreciated that the Army got the job of supplying 600 meals a day for police, firefighters and other disaster crews at the site and on the blockades.

After leaving the canteen, Captain Ratcliff slipped home to get a few hours sleep before leading the service at the temple. During the service he suggested that those who wished to help

during the evacuation might bring a loaf of sandwiches back to the temple. Within a few hours, the temple had received more than 200 loaves of sandwiches to stock the canteen.

Throughout Sunday, more requests were referred to the temple. A team of church members was patched to Sherway Gardens, the enclosed shopping centre just east of Mississauga, to soothe a group of restless senior citizens. Meanwhile other volunteers began to fill orders for food. Rows and rows of tables in the temple auditorium were arranged for volunteers who, in an assembly-line fashion, made sandwiches and prepared meals. This continued throughout the night when the whole operation was evacuated on Monday to a Salvation Army temple in Etobicoke. The makeshift kitchen received welcome help when the band returned early Monday. Seven mobile Army canteen truck delivered meals to police on the barricades and firefighters and others at the command post.

On Wednesday, the kitchen was largely disbanded when CP Air filled the vans with meal prepared in the airline's flight kitchens at Toronto International Airport.



Volunteers distribute food, received from a fast food chain.

Meanwhile other Army volunteers from Etobicoke, Oakville, Brampton and other parts of Mississauga helped in other evacuation centres by preparing meals, calming frayed nerves, and supplying games and coloring books. When the week was over, the church had served 20,600 meals at six different locations. While other groups ended their operations, the Army filled the gap for many families who needed financial help until the next pay cheque was available.

Just as visible and dedicated as the Red Cross and the Salvation Army were hundreds of other volunteers and groups. The St. John Ambulance Brigade, active in moving patients from hospitals, also performed numerous services in many evacuation centres. They established first-aid posts in 10 centres where they distributed pills, treated pregnant women and administered medications.

At the Brampton campus of Sheridan College, St. John operated an evacuation centre. The school's kitchen staff prepared meals while St. John members manned the other operations. This centre was particularly successful because it was located in a well-equipped school. Facilities, such as the college swimming pool, games rooms and showers, were opened for the evacuees' use. The college's animal husbandry section was an excellent spot for boarding pets. In some centres, pets were placed in separate rooms or areas.

Nevertheless, hundreds of volunteers were the backbone of the successful resolution of the crisis. Lt.-Col. John Sutherland, provincial chief staff officer of St. John Ambulance, admitted he was amazed at the general enthusiasm and long hours of volunteers. "You have to be crazy to be a volunteer," he said admiringly. Some volunteers worked several hours at a centre, went to work and returned to the centre. Everywhere, they worked around the clock with little sleep. Dishes had to be washed, floors mopped, tables and chairs set up and first aid administered.



Evacuees listen to developments at the site, hoping the end is near.

Scouts, Beavers, Venturers, Girl Guides, Navy Cadets, service club members and helpful persons pitched in to make life in an evacuation centre a little more comfortable. Stories about volunteers caring and general helpfulness are abundant. But each story has an element of the more fortunate wanting to help those in distress.

The Malton Thunderbird District of the Boy Scouts is one example. The district commissioner and his assistant were monitoring the activity of the evacuation on a ham radio on Sunday when they heard that the International Centre was going to be used as a reception centre. Packing up the radio, they called other leaders and went to the centre, where a weekly bingo game had just ended. As Scouts and leaders quickly appeared, tables were collapsed and chairs stacked so a sleeping and catering area could be planned. After the initial organizing and setting up, the Red Cross, Salvation Army and St. John Ambulance arrived to find part of their tasks done. The Scouts then were engaged in a multitude of tasks. They distributed nearly 3,000 blankets, moved more tables, cleaned washroom facilities, served hundreds of cups of coffee and unloaded trucks of food. In the days ahead, they were assigned to clearing garbage, locating lost persons, particularly

children in the centre, and attending to handicapped or sick evacuees.

When the evacuation expanded, leaders and boys quickly responded to the call for help in other centres and provided similar services. When the centres were closed, Scouts, Girl Guides, Beavers and other scouting agencies helped in the final cleanup.

But volunteers found helpful allies in many food store managers and owners who opened their doors and allowed various volunteer groups to select whatever was needed from their stores. As well, fast-food outlets supplied their specialities to the centres without any charge.

In the final analysis, the success of the Mississauga evacuation belongs to the people. The willing, helpful volunteers who spent hours preparing meals, washing dishes, and making evacuation centres as comfortable as possible, deserve much credit. As well, the evacuees, who left their homes and remained in centres or homes of friends or relatives, bore the burden with as much perseverance as is humanly possible.



Communications

The scene was familiar throughout the week. A sea of microphones, cameras, bright lights, and people signified news conference, a reporter's bread and butter and the command post's avenue to the public. One of the most important aspects of any emergency is responsible, accurate news reports. The Mississauga derailment provides a textbook example of how, for the most part, this was accomplished. The command post's good relations with the news media accounted for the general public confidence in the decision-makers. Nothing calms a frightened citizen better than the feeling that the authorities are being frank with them. It's better to hear and read the news than to speculate on rumors. As Solicitor General Roy McMurtry noted later:

"At all times [in] our dealings with the press, we really wanted to take the press into our confidence. We know the press have to play an adversarial relationship. That's the role of the press in many cases. We don't resent that. But in this case, we wanted to continue to convince them that we were taking them into our confidence and were levelling with them. Because if they felt that they weren't being levelled with, the message would get outside and people might be storming the barricades. That was something that concerned us very much."

Within minutes of the first explosion, news reporters and photographers were on the scene. Others were telephoning fire and police departments to determine the nature and extent of the disaster. Within the first hour, a senior police officer was assigned to handle on-the-scene news media liaison. Under the Peel force's communications plan, an off-site media centre was established in its police headquarters in Brampton, where telephone inquiries were answered and news reports were monitored for accuracy. Both services continued throughout the week.

Police knew the importance of accurate news



Command post officials announce developments to the news media.

reports. Although almost 50 per cent of the people evacuated saw or heard the explosion, another 20 per cent first found out about the accident from a radio report. A study by the Institute for Environmental Studies at the University of Toronto also indicated that an additional 20 per cent learned about the derailment through family, neighbors and friends.

Involving the evacuation, the study showed that more than 40 per cent of evacuees interviewed received the message that they should evacuate from police officers, either knocking on doors or calling through a loud hailer. However, another 26 per cent heard the evacuation notice while listening to the radio, and 18 per cent learned about the

evacuation of their area by watching television. Only 11 per cent heard from friends or relatives.

In the first hours, reporters on the scene scrambled for facts by interviewing various officials. But as the situation stabilized, news releases were distributed primarily from Peel Regional Police. Later, news releases, approved by the command post team under the Peel police logo, were handed to the more than 250 members of the news media, including those from Europe, Japan and the United States, who had flocked to the site.

However, reporters from local radio and television stations and newspapers were particularly important in providing a link between

command post officials and evacuated Mississauga residents. Peel Regional Police assigned 12 officers, knowledgeable in news media relations and emergency operations, to handle relations between the media and the police on and off the site.

One of the reasons communications with the media was so successful on the site was Peel Police Superintendent Karl Barnhart. The 44-year-old superintendent was the first senior police officer on the scene. Hearing the explosion at his home in nearby Clarkson, a residential community within Mississauga, he went to his backyard to see the fire and immediately drove to the site after telephoning headquarters. He was assigned the task of being the Peel police's chief liaison with the ever-swelling number of the news corps. Consequently, he became the voice and figure of command post announcements since his voice and image were used in about 70 per cent of the radio and television reports. The French television network even dubbed his voice in French for its footage of the disaster. But his most difficult task was controlling the amount of information to be released. Through the media, he had to also impress upon evacuees that their homes were safe and there was no need for worry. The superintendent said the news media seemed to understand the situation was grave and only certain information could be released. Nevertheless, he did all that was possible. He organized tours and set up news conferences as well as answering reporters' countless questions. "At times, I was surrounded by them. They were 20-deep." Under relentless questioning, the superintendent never lost his cool professionalism — even through 12-14-hour shifts.

Similarly, the Ontario government handled news media relations involving its ministries participating in the emergency and developments at the site. The government's and police efforts in dealing with the media were co-ordinated. Bob Frewin, director of the information services branch at the

Ministry of the Environment, began to handle government and general media relations when he arrived at the scene on Sunday morning. He became particularly a link between his ministry's experts and reporters.

Later Sunday, David Allen, director of communications for the Attorney General's office, and Allan Dickie, director of media communications for the Solicitor General, assumed the overall responsibility for co-ordinating government communications, working in close liaison with the Peel police communications team. Both well-known to

the local media, Allen and Dickie divided duties. Allen, deemed the inside man, attended command post meetings and helped to write news releases while Dickie took the outside duties of keeping in close contact with reporters, attempting to fill their requests for interviews and updating media on developments.

During the week, the media were also used to pass on public service messages and to help arrange private accommodation and services for evacuees. Several Mississauga and Toronto radio and television stations maintained 24-hour news coverage and information shows for families of



Superintendent Karl Barnhart, surrounded by reporters and microphones, answers questions.

evacuees. Peel Regional Health Unit, Children's Aid Society, school boards, fire department and police took advantage of the air time and issued messages.

To ensure that the public was receiving the correct information, all news reports were monitored for accuracy at the Ontario Provincial Police headquarters in Toronto, where a communications room had been established with several television sets, radios and wire service copy. Peel Regional Police was alerted of any incorrect report and, if necessary, notified the reporter or news organization of the error. This was particularly crucial when evacuation zones were lifted on Tuesday and Friday. News reports were also checked by government officials.

In the early stages of the emergency, the releasing of news was informal. On Sunday and Monday, news conferences after "think tank" meetings were held on the street outside the command post in the best scrum fashion. On Tuesday, formal news conferences were arranged after the meetings and permitted reporters to question elected officials and other command post experts in a more orderly manner. It was realized that it would be worth the effort to take the communications process a step



Reporter and crew from ABC News tape report.

further — past the elected officials and technical experts — to the news media. After scientists had explained safety difficulties in layman's language and in an easily-understandable manner to elected officials, technical experts and media relations staff wrote news releases, sometimes including diagrams which explained developments and hazards. Following questioning of elected officials at news conferences, technical experts would outline the situation to reporters. Officials now feel that this process should have been instituted from the beginning because it presented to reporters an open and informative approach. It also showed reporters that officials were speaking with one voice. Unlike Three Mile Island, a nuclear plant accident causing 140,000 persons to evacuate in Pennsylvania in March, 1979, the media had clearly-defined sources of information. The media were not tempted to pursue conflicting pieces of information from different agencies and private sources as they did at Three Mile Island.

This openness was also illustrated when tightly-controlled groups of reporters, photographers and cameramen were taken by bus on Tuesday to the site of the derailment. And in another situation, a group of U.S. journalists, professing not to believe that looting wasn't rampant in the evacuated areas, was given a private tour of the area. Looting during such emergencies in the U.S. is a common occurrence. Peel Police Staff Inspector Barry King said he decided to prove to the U.S. visitors that police patrolling had paid off. They were driven by bus through the area. "They were convinced," King said later.

For further openness, interviews were granted by "think tank" officials to give reporters an extended explanation or basis for feature stories.

When not attending news conferences or filing stories, reporters and photographers remained in a media centre located in a truck stop across the street from the command post. The media centre,



Cameraman on top of truck films the site.

Photographers and television crews take advantage of media bus trip to the site, taking pictures and picking up sound en route.

established by Peel Regional Police on Sunday, was equipped with telephones and sufficient space for typewriters and interviews, but was hardly a luxurious setting. Meanwhile, many international news organizations sought information from Peel Regional Police headquarters in Brampton or Mississauga city hall, where 24-hour information services were operating. Both information services received the latest official news release from the command centre.

Throughout the week, the usual camaraderie developed among news media and officials. For example, they had a pool to see whether Walter Cronkite, veteran anchorman on U.S. television network CBS, would pronounce "Mississauga" correctly on his nightly news program. He never did.

Two legends of news media folklore were upheld during the week. The first — reporters ability and love of drinking — remained intact after a Canadian reporter got so drunk at the site that Peel Regional Police arrested him for being drunk in a public place and took him to the force's headquarters in Brampton.

The other — publish or be damned — was upheld when the Mississauga News, a local weekly newspaper, published its regular Wednesday edition despite being evacuated from its building. With the help of printing presses in Acton, west of the derailment, the newspaper was able to sell a 12-page special edition on Monday, 36 hours after the derailment.

But Peel Regional Police Chief Douglas K. Burrows summarized the role of the news media in such emergency situations to a symposium in April, 1980: "A recognition of the media's task and its capability to assist in an operation of this magnitude is essential and their role as communicators must not be underestimated."



The Meetings

During the crisis, the command post located about a kilometre north of the derailment became the centre of activity. It was similar to a war room—maps, charts and experts. The first meetings on Sunday were held informally at the site and in the Peel Regional Police trailer where Chief Douglas Burrows consulted experts and politicians. On Monday as more people gathered to provide advice, the group moved into a second floor room in the Bell Canada building. Tension hung heavily in this stuffy, windowless room.

Solicitor General Roy McMurtry acted as the group's chairman while Mississauga Mayor Hazel McCallion, Frank Bean, Chairman of Peel Region Council, Police Chief Burrows and Fire Chief Gordon Bentley became the inner group. They called upon chemists, police and fire officials as well as environmental, health, chemical and communications experts to advise them.

During these meetings, dozens of decisions were taken and in all cases, the safety of residents was the primary consideration.

Notes and eventually tape recordings were made of the meetings so that there would be a permanent and reliable record available of the decision-making process and the role taken by various participants in the meetings.

In a speech to the Ontario Industrial Waste Conference on June 18, 1980, the solicitor general outlined the process this way:

"The transcripts reveal that there were a series of decisions to determine when it was safe for residents in the different sectors to return home. Without exception they demonstrate that every one of these decisions was made after canvassing the thoughtful advice of the government, academic and industry experts. No one who had a useful contribution to make was knowingly excluded. Without exception, every one of our decisions had the unanimous support of everyone in the room, including a vice-president of CP Rail.

"The transcripts further show that public safety



was the primary consideration, that lives and health took precedence over any other considerations. Let there be no doubt about the fact that those meetings were often tense. The stakes were enormous. We were making decisions that could immediately affect the health, and even the lives, of a quarter of a million people. In the course of the federal inquiry, efforts have been made to discredit this process and the decisions taken. But I want to stress ... to the people of Mississauga that I am satisfied that we had the best advice available, that we explored every issue thoroughly and that we took the proper and prudent course."

For the purposes of this book, one meeting has been selected to illustrate the manner in which the

A discussion between experts at a command post meeting. From left to right: Chairman Frank Bean of Peel Region council (back of head), Environmental Minister Harry Parrott, Greg Van Volkenburgh of the environment ministry (standing), John McGee of the Canadian Transport Commission, Peel Police Staff Inspector Barry King (seated along the wall), Fire Chief Gordon Bentley, Chief Fire Inspector Cyril Hare, Dr. Max Fitch of the health ministry (standing).

meetings were conducted, the tone of the discussions, the type of technical information dealt with and how, in the end, differing viewpoints came together for a unanimous decision.

When the group met on Wednesday — the first day the proceedings were recorded — two-thirds of the evacuated residents had returned to their homes the previous day. The pressure had risen as the rest of the evacuees became anxious. Mayor McCallion recalled that this day was her worst. She was weary from little sleep and enduring severe pain from a sprained ankle, suffered Tuesday night just before granting a television interview.

Meanwhile, workers struggled to seal the chlorine tanker. A half-empty propane tanker was being lifted and drained, and an upset of this delicate operation would likely mean that the propane would explode and tear open the chlorine tanker.

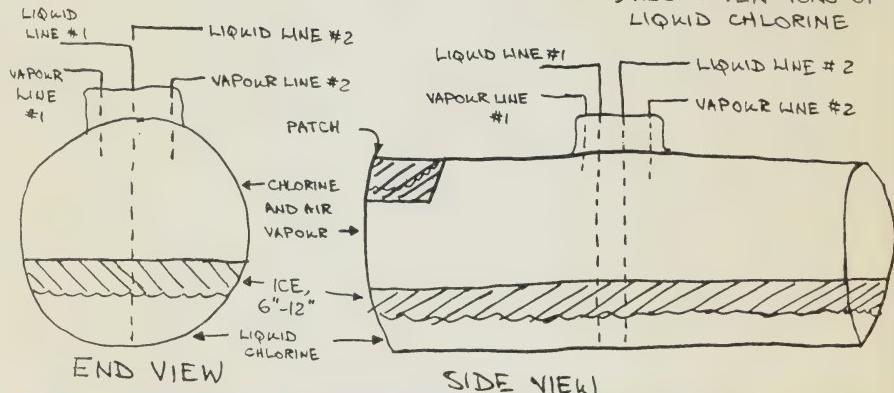
On Thursday, the patch on the chlorine tanker was sealed as tightly as possible. The command post group faced the task of deciding when the chlorine should be removed. Weather conditions were vital for the decision as well as assurance that no more chlorine releases were possible. The meeting opens with Graham Scott, deputy minister of the Ontario Ministry of the Environment, outlining his ministry's report on chlorine emissions. Following the deputy minister's remarks, discussions began on the methods and risks of removing the chlorine.

Graham Scott, deputy minister of the Ontario environment ministry: "We have reached a stage where we have stabilized, quite considerably, the scene insofar as emissions are considered. There is really no problem for anyone, with the possible exception of pockets lying around close to the site. We have to look at where we propose to go from here in relation to removing the chlorine. Most important, I think the only clear step we have to take at this stage is to start moving the liquid chlorine out. But there is a real question as to how that can be done and at what risk. . . ."

MATERIALS IN THE CHLORINE TANK CAR WHICH

NOW REMAIN:

- a) VAPOUR
- b) ICE, 6"-12" THICK
- c) ABOUT TEN TONS OF LIQUID CHLORINE



Fred Hamlin, a member of the Dow Chemical crew: [He is sketching the tanker on a drawing board.] "There is a dome up on top with a number of connections off. . . . There are four to be exact. Two of these are what we call liquid deductions fitting on the car and they go right to the bottom of the tank car within an inch or two. And these are the lines used to move a liquid from a tank car. The other two lines — these are valves which control the flow out of these lines — vapor lines . . . just project into the top space of the tank car. We normally load the car with liquid from this line. That is, a healthy chlorine car. What we have[in] this car, it's about a three-

foot gash in the car projecting slightly in the curved portion of the head. We have a patch over the top of this which is pressing down on it.

"We have virtually stopped all leakage around that hole except for one very small area. We worked last night to secure that patch in a much better fashion. We succeeded to a degree, but we didn't get the leak stopped completely. . . . We have a line going from this into a tanker truck . . . [which] has a pump which is pulling a vacuum on the truck. This vacuum is pulling the chlorine through this line, and the truck is filled with a caustic neutralizing substance.



Solicitor General Roy McMurtry listens to Fred Hamlin, a Dow Chemical expert, explaining chlorine removal problems by sketches.

"We have succeeded in reducing the pressure down in the car where there is virtually no leakage except when I stuck my head right by the patch. Really, this is what we set out to do last night — to get the chlorine leakage stopped. This impacts any future decisions of what we are going to do with the chlorine in the car. We have lined up an additional vacuum truck to get more reliability on the vacuum. This caustic will get filled with chlorine after a while but we have a second truck there to take over.

"Basically, we want to have it so you don't have to switch lines over, just have turning valves to do this. ... We had a man put his head over the hole and did some poking with a pipe to determine depths. And from our best guess between the patch and what we could see with frost, we had guessed that there were 7½ to 10 tons remaining in the car since yesterday morning and we estimate from 50 to 100 pounds an hour vaporizing off.

"We know for sure [that] above this we have a layer, a mixed layer of ice because the chlorine is -30 degrees Fahrenheit in that car because there is no pressure on it, and it self-refrigerates. During the fire, water obviously got into the tank car and built up a layer over top of that. A mixture of chlorine and water forms a slushy substance. ... You will see how that ice complicates our thinking. Our next move

MATERIALS IN CHLORINE TANK

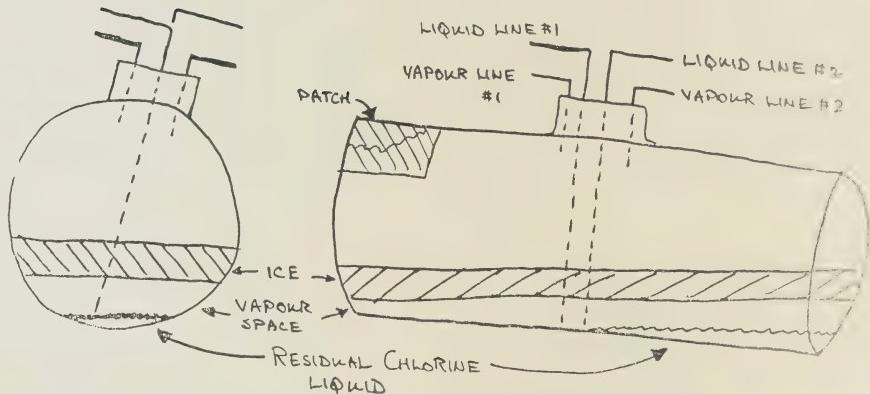
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CAR REMAINING AT THE END

OF STAGE 2 EVACUATION

(ABOUT 16 TONS WILL BE
REMOVED DURING STAGE 2)

- a) VAPOUR
- b) ICE, 6"-12" THICK
- c) ABOUT 2 TONS
OF CHLORINE



would be to hook a line to a chlorine tanker truck. This line and the chlorine tank truck is sitting under a vacuum. So, if you open this valve, it's going to suck in.

"Our next move will be to get this hooked up, and we have to be very careful about what we are doing here and do a lot of talking first. What our intent is, to get this all hooked up and suck the chlorine from the tank car into the truck. The reason for going after the liquid is the expansion from a liquid to a gas is 700 times."

Greg Van Volkenburgh, environment ministry, supervisor of technology development and appraisal. "The liquid will expand to a gas after you pump it from the chlorine tank into the vacuum truck. Is that right?"

Hamlin: "No, not necessarily as long as it stays cold enough here. It should go into the tank truck, if all goes well, a good portion of it should go as liquid."

Van Volkenburgh: "But it would start off as a gas and

11/16/79

as it cools down it would turn to a liquid and stay."

Hamlin: "Yes, now the only risky part of this that I can see is, if you are looking down on the tank car, you are looking down on this surface area and that's liquid chlorine underneath, which is covered with ice, and this is sitting at -30 degrees. The ice is providing some insulation to the liquid chlorine underneath. Our concern [is] and it's a slight one,... if that ice breaks.

"Because you have been pumping that liquid out, you now have a gap here between the ice and the liquid chlorine. I guess our concern is: Is there any possibility that ice could crack from its own weight and fall into the liquid chlorine? And that would do a couple of things — probably break the ice up and expose liquid chlorine to the air — and could cause some vaporization.

"If that happens, we are depending on the chlorine vent lines and the patch. And the worst thing that could happen would be that you could get too much pressure on here and lift that patch up.

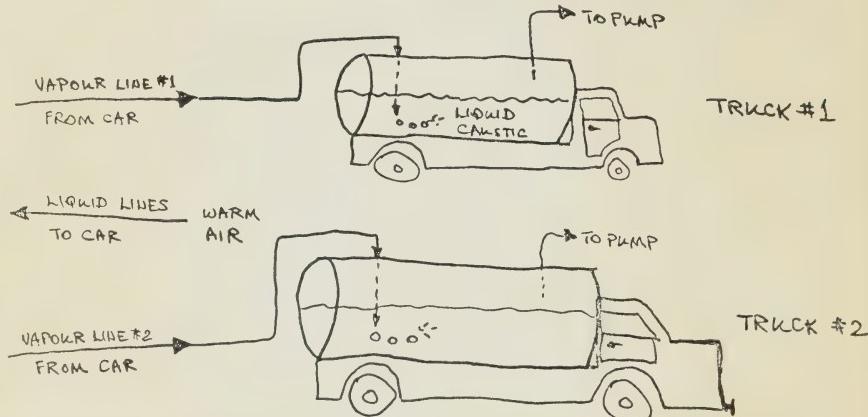


Greg Van Volkenburgh, Deputy Environment Minister Graham Scott and Solicitor General Roy McMurtry ponder the alternatives.

STAGE 3 EVACUATION

OF CHLORINE TANK CAR

(TRANSFER RESIDUAL LIQUID FROM
CAR TO CAUSTIC TRUCKS BY VAPORIZING IT)



There is no way we can determine what the condition of the car is under there. The only thing we know for sure is last night, before we had this good vacuum system on it, it was holding three to four pounds per square inch of positive pressure. So, that's the only risk I can see as far as pumping that liquid out or drawing the liquid out....

"Everything I can see says we are OK, but it's what I can't see that worries me. So that basically is what our approach is. We improved our venting system last night and getting hooked up to try

moving this liquid. ... We also have had experience with using a liquid chlorine pump to put into the line. However, that was in the situation that we could get a good patch on the car and knew the condition of the car. This pump requires five-to-10 pound pressures on the car in order to draw the chlorine out. So, right now we are saying we don't want to pressure the car. We want to get it as close to zero pounds as possible.

"The other possibility is 7½ tons left in the car. Is there some quick and dirty method? This is an

option. You pull a vacuum on a car. You get a very large quantity of caustic solution in water. You get everyone back for miles. You get some guy to start those pumps and fire as much caustic and water in that car as you can, and it will neutralize quickly; but it also heats it up. However, as far as I am concerned, that's not a good option. In Florida, this was done. There were no injuries as a result of it. It was all handled correctly, but it doesn't sound like a very good alternative here at the moment. That's one we looked at.

Police Chief Douglas Burrows: "What if 7½ tons of chlorine is released into the atmosphere or into the environment? What would be the worst that could happen?"

Van Volkenburgh: "We haven't run the model. I was going to wait until we had a better picture today. We will go and run that model again to see what the effects are."

Chief Burrows: "I am not talking of caustic soda and water."

Hamlin: "I have seen 3½ tons myself and believe me, it's impressive."

Roy McMurtry, Attorney General and Solicitor General of Ontario: "I don't think anyone wants to seriously contemplate that option." . . .

Hamlin: "The worst that could happen is that it would split open at the liquid level. If the tank burst or split at the gas phase, you would have an initial release of chlorine, and it would settle back down again to where you are now."

McMurtry: "How much extra pressure has been put on the structure of the tank by reason of this vacuuming process? The next step that I think that you are recommending is to start the vacuuming



Fred Hamlin (centre and standing) describes the situation to the meeting.

process so far as the liquid chlorine is concerned, and can you tell us, laymen, how much pressure that can put on the tank itself, the structure of it?"

Hamlin: "Apart from this relatively remote . . . possibility of the ice cracking and causing a problem, it should not cause any problem with the pressure at all. It should help it if anything."

McMurtry: "The unknown factor is the ice cracking and that could put considerable pressure on the tank."

Hamlin: "That's right, but apart from that, I can't see anything that the drawing off of liquid is going to do that."

Harry Parrott, Ontario minister of the environment: "But that can't be a perfect seal now with the ice?"

Hamlin: "No, it can't be."

James Erskine, Deputy Commissioner of the Ontario Provincial Police: "Is the ice sitting right on top of the chlorine?"

Hamlin: "I would guess it might be sitting a little bit above right now because we have been drawing off that tank car for better than 24 hours, but initially it probably would have been sitting right on top of the liquid chlorine. That's my problem. I don't know what's going on in there."

Erskine: "Because on the edges the ice might not be adhering to the tank?"

Hamlin: "Well, it's pretty well-insulated though."

Van Volkenburgh: "Fred, are you drawing off just enough to keep the tank off the atmospheric pressure?"

Hamlin: "We are drawing off as fast as we can. If you are successful in getting the liquid from here, and I would say as far as I am concerned we have got reason to believe that we are successful in doing that. Let's assume we are. You are still going to be left with an inch or two of chlorine in the bottom of the tank car. Even after we have done our best with the liquid extraction on the tank car, you are going to have some small amount. We have some options of what we will do with that. One is to flood it with the tank car. The other option is to take the non-disturbing approach, and that would be simply to introduce warm air to the tank car and that would

have to be very controlled. Regulate the air with the maximum flow we could get under that condition and allow that air to vaporize the chlorine. There are other options of what looks like the lower end. There's a hole in the shell. We could probably add warm water, but that could take a matter of days to take that last bit of chlorine out of there."

McMurtry: "That's if you go the air route as opposed to the caustic soda?"

Hamlin: "Yes, and that caustic soda route, you are still faced with how much you've got left after what

we have put in. We may even decide on that point, that we may devise some method to take a look. We may have to take some of the insulation off one end."

McMurtry: "I assume that, perhaps wrongly, the removal of the tank itself is really not a viable option because we don't know enough about the stability?"

Hamlin: "Yes, that's right."

Hazel McCallion, Mayor of Mississauga: "Have you established at this point that there is no possibility of you sealing the tank?"

Hamlin: "At this point, yes. We have said at this point that we are down now to the point where the patch is doing as well as we want it to do right now."

McCallion: "But you don't think you could improve that, you know, seal it completely?"

Hamlin: "If we could, the only advantage would be to allow us to pressure the car, and having looked at the car, and because it's structurally inaccurate, I would not want to take that chance at this point."

Then, Chief Burrows questioned whether an estimate could be made on what area still would be safe during the chlorine removal operation. Van Volkenburgh volunteered to get the answer. However, it was discovered that too many uncertainties remained to give a definitive answer. If a chlorine release occurred during the operation, no one could accurately estimate how much chlorine would filter into the atmosphere and what the wind direction and speed would be. McMurtry began to summarize frustrations and concerns.

McMurtry: "You see, at some point in time, with people out of their homes, if I were one of those



After the patch was in place, Stu Greenwood (left) shows the sealing job to Otto Jelinek, Solicitor General McMurtry and James Erskine, deputy commissioner of the Ontario Provincial Police.



George Trewin, assistant director of the environment ministry's central region, briefs police.

people, I would be asking: 'Well, what is the risk?' If it is one-in-10,000, I would be prepared to take that. I would say every time I get in my automobile I have at least one chance in 10,000 of getting pranged. I think the public is beginning to ask these questions. I mean are the risks lower than what the average [person] exposes himself just getting in their automobile and driving down the highway?

"And I think those of us with political responsibility need to have some better understanding if it is possible to talk in those terms. Admittedly, we have talked about starting from a desired scenario

and then moving back, and then subtracting from that, so that we would make our decisions on a rational basis. But at some point in time, we may have to indicate to the public just what the risk is and decide whether or not in taking this risk we have to evacuate further or tell people they can start to come back into their homes but there is a risk. I don't know the answers to these questions, but obviously we can't wait as the chief, our chief, has said. And he is not suggesting that we wait for the next three weeks for this vapor to be collected off, and I think that's your concern. . . . Is it the view, is it the

consensus that the vacuuming of the liquid should go ahead but we should wait for the favorable weather conditions?"

Scott: "As far as we are concerned, it is impossible to calculate exactly what that risk is. There is no rationale where you can say one-in-five, or one-in-100,000. But given all the uncertainties there, I think clearly it's our view it's not worth the risk with the wind direction running now to make the move [of removing chlorine]. However, when the wind is coming from the north, then we are in a different situation.

"If worse came to the worst and that did happen [a further release of chlorine or other type of chlorine accident], the chances of serious damage would be, by comparison, quite small area. I think it's been considered opinion in a very difficult area that we withhold making that move until such time that the wind is favorable and favorable for a dependable period of time as the weather can give us."

Van Volkenburgh: "I presented those numbers to give a qualitative idea. The tank right now is the most stable that anyone could get it, and I think Fred [Hamlin] would agree the risk is probably going to go up a little bit when you start applying the vacuum and you have the ice in there."

Hamlin: "The only factor is how you are going to increase the gap between the ice, but in my opinion, it's a slight risk. When you take liquid, you speed up the process by 700 times."

R.S. Allison, vice-president of CP Rail: "Mr. Minister, it seems to me that the liquid chlorine should be removed. It has to be removed at some time. It seems to me that the sooner it be removed the better, and I have listened to discussion, and it seems to me that it is really a minimal hazard to remove the liquid at this time."

McMurtry: "Well, I'm not sure what you mean, Mr. Allison. I think the view of everybody here, well the view of the ministry of the environment people, is that there is a risk that they don't think people of this area should be exposed to at this point in time. Given the wind conditions, nobody can say whether it's one-in-five or one-in-1,000.

"It's just an impossible calculation as I understand. I think those of us who, around the table, who have political responsibility or senior responsibility in relation to the public in this area, obviously cannot reject the advice of the ministry of the environment which, I think, is shared by the ministry of labour, Dr. Max Fitch, who is our senior expert in industrial health with the ministry of labour.

"You see, this is the dilemma that we face, and we have a mayor of a major Ontario city, who would dearly love to have her people relocated, who is under enormous pressure, and yet, I can't speak for her, and she's better than anybody at speaking for herself, the difficult position the mayor of Mississauga is in at being advised by the ministry of environment and the ministry of labour I don't know whether Dr. [Bob] MacBride (of the emergency health service section of the ministry of health), you would like to offer your view with respect to the ministry of health.

"While no one quarrels with the general observation that it's a minimal risk, it's a risk that, at the present time, our ministry of environment and our ministry of labour, and I don't know whether the ministry of health would like to offer a view at this time, are advising us not to take, given the wind conditions.

Dr. MacBride: "Well, I think I would have to concur with the standpoint of caution, particularly with the wind conditions the way they are. I can certainly see some rationale for the suggestion that when the wind is more stable that it is going into an area where

it is less populated. In other words, I agree with Dr. Fitch." . . .

Van Volkenburgh: "Also, consider that you've got the Credit River Valley and the chlorine is probably going to sit in there. We were seeing high readings, I think, yesterday afternoon over the Creditview River Project. The plume was going this way and very low at the end of Dundas Road. It was a plume about 100 metres wide. Down here at the QEW [Queen Elizabeth Way], it was still. Here it was about a half a mile wide. This was with a fairly light north wind.

"Later on at night, . . . the wind was still blowing this way [and], we drove down to the mouth of the Credit River here in Port Credit [a southern portion of Mississauga], and for some strange reason, which we think was the cold coming out of the valley, even though the readings here are lower. So you're going to have geographical differences. . . . Again, we are talking about the low probability situation that if you wait 12 hours from now when we are hoping the wind is from the north, if the weather forecasters are right, then you start this pumping operation and hopefully it happens."

Chief Burrows: "I guess from what I have heard, then we really only have two choices — either we continue with the work in which case these people have to be taken out or at least advised that they should be taken out, or wait for the wind to change and hope that we can contain the people — neither one of which are very good."

Otto Jelinek, representative of the federal transport minister and Member of Parliament for Halton, an area riding: "How long does it take to pump the liquid out?"

Hamlin: "We won't know until we get it going."

Jelinek: "Is it hours or days?"

Hamlin: "If everything goes well, it's a matter of hours. We could get into vapor locks." . . .

McMurtry: ". . . It appears to be the strong recommendation of the Provincial Government, supported by Mr. [John] McGee, who is the commissioner for the Canadian Transport Commission, not to proceed with the vacuum operation, so far as it involves the liquid chlorine, until there are more favorable wind conditions. And I guess the question that was in some of our minds was that: Assuming that that happens, and we proceed with that operation and the wind changes to the north so that it's blowing south, if there is an unexpected change of wind, say to the west, for example, so that it's blowing east, are you in a position to stop?"

Hamlin: "We can stop it. Yes."

McMurtry: "And the stopping of it does not involve a particular problem?"

Hamlin: "No."

McMurtry: "It doesn't increase the hazard?"

Scott: "My point is if you're . . . a foot down and you have a foot left to go, maybe you're better to keep going with that last foot because when the ice eventually does give way, they'd be left with the splashing . . . as opposed to . . . once you've opened the space — that means the ice is going to fall. It's going to fall anyway at some stage or other and you're better just to keep pumping rather than stop. Once you're committed, maybe you'd better go the whole route rather than stopping as soon as the wind changes because stopping won't make any difference to the ice falling."

McMurtry: "Well, I just wonder how this is



*Police Chief Burrows, Deputy Minister Scott
and Solicitor General McMurtry
study map of Mississauga
to determine areas to be repopulated.*

explained, assuming that we are going down this path, to the public. Once we start down this path, there's no turning back and if there's a sudden shift of wind, that's part of the risk.

“... If it's going to collapse, we are satisfied that in all probability, it would collapse during the early hours and then at what point, have you any thoughts as to what extent you feel that we should get into the last stage, and that is the inch or two of chlorine that may be left after you have vacuumed as much as you can out?”

Hamlin: “I think about all we can say on that at this point is that once we've got the last of the liquid, we'll have some idea of where we are in terms of quantity in the bottom of the car, and knowing these results that we are getting today on the rate of vapor flow from the car, we'll have a pretty good idea on how long that would take. In other words, we could vaporize it off under very slow conditions.”

Van Volkenburgh: “You'd know this sort of rate of vapor transfer before midnight?”

Hamlin: “Yes. . . . Well, the way we're going to know whether we got rid of all the liquid is we'll start getting vapor. We're also doing some removal of the lagging and so on, and because it's an outside end of the tank car, so we can better establish the cold frost line. That would give us a better indication than what we have right now.”

McMurtry: . . . “I realize there are differing views as to the nature of the risk, but is there anybody here who wishes to go on record as opposing the recommendation of the provincial government and the Canadian Transport Commission.”

McCallion: “Well, Mr. Chairman, I do want to hear from the CPR. I know you asked a question. I am more direct. I want to hear whether you agree or you disagree.”

Allison: “We support the position of the provincial government as taken.”

McMurtry: “Thank you very much. You see, if I'd only learn to be as direct as the mayor.”

The final meeting was held on Sunday, November 18. Solicitor General McMurtry thanked those present, including Stewart Allison, vice-president of CP Rail, and John McGee, of the Canadian Transport Commission. The final comments:

Allison: “Mr. Minister, Madam Mayor and gentlemen, we've all had a very difficult week, and on behalf of Canadian Pacific, I would like to express our appreciation for all the help and assistance that we've received.”

McMurtry: “Thank you, Mr. Allison.”

McGee: . . . “Although I'm not of the highest estate in the federal hierarchy, I seem to be the senior fed here this morning. And I want to congratulate you and to express to you and the mayor my admiration for the way this thing has been handled at the provincial and municipal [levels of government] and their jurisdictions, and I think it's the reason that we're sitting here now without a single loss of life.”

McMurtry: “Thank you very much, Mr. McGee.”

The activities which followed the train derailment in Mississauga represent an inspiring story.

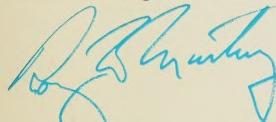
As chairman of the group of elected representatives and public servants which co-ordinated the response to the emergency, I saw first-hand the dedication, competence and plain hard work of hundreds of people acting under tense and dangerous circumstances. The fact the evacuation of Mississauga went so smoothly is conclusive evidence of the foresight and planning by hundreds of individuals who showed by their actions what it truly means to serve the public.

This book is their story.

Like the emergency response itself, the book is a co-operative effort of the dozens of agencies and individuals involved. For space reasons, some may appear to have been overlooked. But none have been forgotten.

At the height of the crisis people all over the world marvelled at the evacuation of Canada's ninth largest city. Books and film documentaries were commissioned to tell the tale. Journalists flocked to Mississauga from around the world, as did public safety officials, scientists and students of emergencies and mass movements of people. A year later, they are still coming, still seeking answers to what has been described as the Miracle of Mississauga.

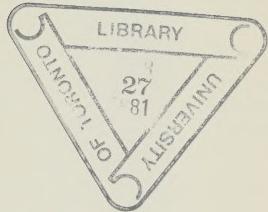
The book is dedicated to the people of Mississauga. By their co-operation, common sense and courage, they showed the best of what makes us Canadians and in doing so set a model for the world.

A handwritten signature in blue ink, appearing to read "R. Roy McMurtry".

R. Roy McMurtry
Attorney General and
Solicitor General for Ontario

November, 1980





This book is a co-operative effort of the agencies involved in the emergency. It was written and edited by Mary Clare Havey, Allan Dickie and David Allen and designed by Desmond English.

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